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## DISEASES CAUSED BY BACTERIA AND FUNGI

BULL, G. N. (1945.) **Bovine mastitis.**—*Vet. Rec.* 57. 287-289. 208

G. classifies bovine mastitis on a clinical basis as follows.

Mastitis due to streptococci:

- A. *Str. agalactiae*—(i), (ii) and (iii). Acute, subacute and chronic of the lactating cow. (iv). Subacute of the dry cow.
- B. *Str. dysgalactiae*—(i) and (ii). Acute and subacute of the lactating cow. (iii). Subacute of the dry cow.
- C. *Str. uberis*—(i). Subacute of the lactating cow.

Mastitis due to staphylococci:

- A. *Staph. aureus*—(i). Hyper-acute of freshly calved cow. (ii), (iii) and (iv). Acute, subacute and chronic of the lactating cow. (v) and (vi). Acute and subacute of dry cow.

Mixed infections:

- A. *Str. agalactiae* and *Staph. aureus*—(i) and (ii). Acute and subacute of the lactating cow.

Mastitis due to *Corynebacterium pyogenes*:

- A. *Corynebact. pyogenes*—(i). Acute of the dry cow and heifer.

The clinical features of these various types are described. The treatments described are on conventional lines. For acute and subacute *Str. agalactiae* mastitis, sulphanilamide *per os* or a combination of sulphanilamide therapy and udder infusion with 10,000 acriflavine are effective. Where induration is present, a soluble sulphonamide by infusion such as phonamide E.O.S., suloseptisine or L.S.F. is preferred. In chronic cases, infusing with acriflavine on successive days is advocated. In *Str. dysgalactiae* mastitis, response to sulphanilamide is less satisfactory and infusion treatment frequently has to be repeated several times; *Str. uberis* infection is also less responsive to treatment. In staphylococcal mastitis, sulphanilamide of little or no value; staphylococcus toxoid, however, gives reasonably satisfactory results. Infusion is contraindicated, the results usually being disastrous. Colloidal manganese by injection and aspirin *per os* are useful adjuncts. In *Corynebact. pyogenes* mastitis, the use of specific toxoid is a definite advance. Aspirin is also beneficial in relieving the pain.

In prophylaxis, G. recommends the infusion of quarters known to have been infected during lactation with 1:10,000 acriflavine, when the cow is reaching the drying-off stage. The cleansing of teats with a hypochlorite solution after milking, followed by drying, is also advocated. When freshly calved cows or heifers enter the herd, thorough cleansing of the udder and

teats with a bactericidal detergent such as "cetavlon" is advised and this is also recommended as a daily procedure during treatment of clinical cases. Where widespread infection has existed in a herd, G. finds that milking through the dry period is of great value in infected cows.—D. D. OGILVIE.

MILLER, W. T. (1943.) **The Hotis test for the detection of mastitis bacteria in milk.**—*Circ. U.S. Dep. Agric.* No. 672. pp. 7. 209

In an analysis of the results of 10-15 thousand routine tests, M. reports that the Hotis test agrees with direct culture on blood agar plates in detecting *Streptococcus agalactiae* in milk in 85-90% of cases. This high percentage does not apply to other streptococci causing mastitis, presumably because of their weak fermentation of lactose. *Staphylococcus aureus* is readily detected from the characteristic changes in the milk.

M. maintains that as the chief reason for routine testing is the detection of *Str. agalactiae* and as this is the commonest cause of mastitis, the failure of the test to detect the other species is not a serious objection.

—R. M. LOOSMORE.

\*HUHTALA, E. (1943.) Kokemuksia hevosen pernarutosta. [Anthrax in the horse.]—*Suom. Eläinlääkärit.* May. [Abst. from abst. in *Skand. VetTidskr.* 33. 544.] 210

In the summer of 1942, an outbreak of anthrax occurred in army horses in Karelia and 78% of the "large number" affected died.

Antiserum was given but evidently did not do any good. Carbozoo vaccine was used with good results to protect unaffected horses.—J. E.

GLOVER, R. E. (1944.) **Infection of mice with *Mycobact. tuberculosis* (bovis) by the respiratory route.**—*Brit. J. exp. Path.* 25. 141-149. 211

G. describes an apparatus for the exposure of mice to infection by airborne tubercle bacilli and his method for the estimation of the number of viable bacilli in the aerial suspension. In experiments with fully virulent bovine strains, he found that the minimum infective dose for mice was about 100 organisms and that 1,000 organisms would infect a high proportion of mice; the minimum lethal dose was probably greater than 120,000 organisms.

There was little significant difference in the numbers of bacilli required to set up infection in mice by exposure to aerosol mists, as compared with those required for intranasal infection, but the aerosol suspensions tended to produce a more regular infection. This was ascribed to difficulties inherent in the intranasal technique.

Concentrated aerosol mists induced extensive pulmonary consolidation within 60 days; weaker



suspensions were not lethal, but they stimulated the formation of discrete, slowly progressive foci, up to 4 mm. in diameter.—I. W. BROCKLEHURST.

NANDA, P. N., & SINGH, K. (1944.) A case of tuberculosis in a sheep.—*Indian J. vet. Sci.* 14. 110-111. 212

The authors describe a case in a female lamb of TB. due to bacilli of bovine type, with lesions in the lungs, pleura and mediastinal lymph nodes.—G. L. S.

COTCHIN, E. (1944.) Marie's disease associated with tuberculosis in a horse.—*Vet. J.* 100. 261-267. 213

C. describes a case of hypertrophic pulmonary osteoperiostitis associated with generalized TB. in a four-year-old gelding. Exostoses were present on the mandible, the vertebrae and the limb bones. A feature of the newly formed subperiosteal bony tissue was the roughly parallel, radial arrangement of the trabeculae. The line of demarcation between the new and the original bone was sharply defined.

A dysgonic strain of the tubercle bacillus, which was of low virulence for g. pigs and rabbits, was isolated from a bronchial lymph node of the affected animal.

—I. W. BROCKLEHURST.

ROSA, A. (1942.) Su di uno stipite di M. tuberculosis di tipo umano isolato da una ghiandola peribronchiale di un bovino. [Human type tubercle bacilli isolated from a bovine].—*Nuova Vet.* 20. 239-241. 214

R. records the isolation from a bovine bronchial lymph node of an organism which was at first thought to be the bovine tubercle bacillus, because of its dysgonic growth. Subsequent animal inoculations showed, however, that the organism was of the human type. Cultural examinations alone are not sufficient for the identification of type, but must be supplemented by biological examination.—I. W. BROCKLEHURST.

BONADUCE, A. (1942.) Contributo alla conoscenza delle predilezioni tissutali dell'infezione tubercolare felina e canina. [Predilection sites of TB. in dogs and cats].—*Nuova Vet.* 21. 48-54. 215

B. surveyed the literature of 1882-1940 on canine and feline TB. Analysis of the results shows marked differences between the two species as far as localization of the tubercle bacillus is concerned. A notable exception is pulmonary TB., which occurs to much the same extent in both species, but whereas cavity formation is a feature of the canine disease, occurring in 17.09% of affected lungs, it is found in only 2.79% of affected feline lungs.

In marked contrast is the incidence of TB. of the serosae. Pleural TB. was recorded in 40.74% of cases in dogs and in 6.51% in cats; figures were similar for the pericardium and peritoneum.

Liver, kidney, heart, intestinal and nervous lesions are rather more common in the dog than in the cat. Generalized TB., although occurring rarely, is commoner in the dog. In the cat, spleen and skin lesions are more often encountered than in the dog. Lymph node involvement varies in the two species. In the dog, the bronchial and mediastinal lymph nodes are much more often affected than in the cat. Bone, joint and genital lesions are 3-4 times as common in the dog as in the cat.

Some morbid processes also seem to be exclusive to one or other species; hypertrophic osteoperiostitis, for example, seems to be confined to the dog and various oculoconjunctival lesions to the cat.—I. W. B.

PURCHASE, H. S. (1944.) An outbreak of ulcerative lymphangitis in cattle caused by *Corynebacterium ovis*.—*J. comp. Path.* 54. 238-244. 216

Several cattle grazing on thorny scrub country

developed ulcerative lymphangitis, usually on one side of the body between the flank and the base of the neck. Autopsies revealed that the infection spread from the primary subcutaneous abscess to the lymph nodes by way of the lymph vessels. The prompt slaughter of infected animals eventually eradicated the disease. *Corynebact. ovis* was isolated from the majority of the infected cattle when pus was sown on ox blood agar plates. Although sheep which were experimentally infected with *Corynebact. ovis* isolated from cattle developed intense icterus and general haemolysis, attempts to demonstrate an haemolysin in cultures were unsuccessful.—J. KEPPIE.

WORLEY, G., JR., & YOUNG, G. (1945.) The glanders organism with reference to its cell inclusions.—*J. Bact.* 49. 97-100. 217

It has been suggested that the irregular staining of the glanders bacillus may be due to a preparatory stage for sporulation or to volutin inclusions, but the present authors were unable to demonstrate volutin in organisms grown on tryptose agar and stained with methylene-blue. Organisms from cultures in a Sudan black B wet mount showed granules considered to be fat bodies which stained with Eisenberg's iodine-fuchsin method. 1% sulphuric acid completely decolorized the cells, whereas in controls using *Corynebacterium diphtheriae*, volutin was demonstrable. It is concluded that the irregular staining of the glanders bacillus is due to lipoidal granules.—U. F. RICHARDSON.

OLEŇNIK, N. K., & AVRAMENKO, G. D. (1941.) Poluchenie i vospitanie zdorovykh zherebyat ot sapnykh kobyl khronikov. [The rearing of healthy foals from mares affected with chronic glanders].—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [Diseases of Horses.] pp. 63-66. 218

Observations were made for several years at isolation farms (so-called "mallein farms") on 162 foals born of mares which reacted positively to mallein or the complement-fixation test or which were affected with chronic glanders. Ten foals born of mares affected with chronic glanders became infected during the suckling period, and four after weaning, as a result of breakdown in isolation due to carelessness. The remaining foals were normal during the suckling period and for 1-3 years after weaning.

As a result of their experience the authors recommend horse breeding on the isolation farms, leaving the sucking foals with the mares for 5-6 months and then isolating them. The serological and allergic tests should be performed 3-5 days after birth and then every second month until weaning; from nine months until the end of the second year the examination should be made every three months. Mallein reactors should be destroyed.—A. MOLDAWSKY.

KUBIŠ, L. (1942.) Beitrag zur Epidemiologie des Schweinerotlaufbazillus nach peroraler Infektion von Tauben. [The epidemiology of *Erysipelothrix rhusiopathiae* in the pigeon after peroral infection].—*Wien. tierärztl. Mschr.* 29. 510-511. [Inaug. Diss., Vienna—only abst. given.] 219

Healthy pigeons cannot be infected by the oral administration of *E. rhusiopathiae*, whether this is given alone, or with barley, which might be expected to damage the intestinal tract slightly. Only pigeons with grossly damaged alimentary canals, such as those with intestinal parasitism, can be infected in this way. Such birds might play some part in spreading swine erysipelas naturally.

Healthy pigeons are not likely to spread the disease after ingesting the bacteria since the ingested organisms are killed off in the small intestine. This was shown in



periments designed to determine the presence of *E. rhusiopathiae* in the several parts of the intestine. Live organisms were found in the crop and in the glandular and muscular stomachs, but not in the small or large intestines or the caeca.

Intestinal organisms from normal pigeons were found to have no antagonistic action on *E. rhusiopathiae*.

—I. W. BROCKLEHURST.

RIA, C. (1943.) Su un'enzozia di mal rossino nelle anatre. [An outbreak of erysipelas in ducks.]—*Nuova Vet.* 21. 72-77. 220

D. describes an outbreak of *Erysipelothrix rhusiopathiae* infection in a group of ten three-week-old chickens. Affected birds showed symptoms of anorexia, marked dyspnoea, muscular tremors and incontinence and diarrhoea, followed by death. The P.M. examination of two birds revealed diffuse congestion of the internal organs, haemorrhages in the subcutis and underlying musculature of the head, neck and back, and catarrhal haemorrhagic enteritis, which was particularly marked in the duodenum and caeca; the lungs and intestines were hyperaemic, the spleen was slightly enlarged and markedly hyperaemic, the liver was hyperaemic and yellowish red, with diffuse arborescent haemorrhages, and the kidneys were enlarged and had a mottled appearance; there were small necrotic foci in the epicardium and the blood-vessels of the brain were congested.

The six surviving birds were treated with swine erysipelas antiserum, 1 ml. being administered to the clinically healthy and 2 ml. to those showing any signs of illness. No further deaths occurred which could be attributed to *E. rhusiopathiae* infection.—I. W. B.

ONI, L. (1942.) A propos des bactéries dénommées *Listeria*. Rappel d'une observation ancienne de méningite chez l'homme. [A case of listeria meningitis in man, with observations on resemblance of *Listeria* to *Erysipelothrix*.]—*Ann. Inst. Pasteur.* 3. 92-95. 221

C. recalls the case of an Italian soldier who died of meningitis in 1918. An unidentified Gram-positive bacillus was isolated from the cerebrospinal fluid of this man. It resembled *E. rhusiopathiae* in many respects, but failed to produce  $H_2S$  and was insensitive to the action of swine erysipelas antiserum either *in vivo* or *in vitro*.

The strain was kept and has recently (1942) been identified as *Listeria monocytogenes*. It seems to have changed very little over the years, although it is now virulent for the mouse and rabbit and has apparently acquired the ability to ferment sucrose and lactose.

C. gives a summary of the resemblances between *monocytogenes* and *E. rhusiopathiae*, and of their distinguishing features.—I. W. BROCKLEHURST.

IE, W. C. (1945.) A proposed biochemical basis for the genus *Pseudomonas*.—*J. Bact.* 49. 459-462. [Author's summary copied verbatim.] 222

It is suggested that the genus *Pseudomonas* should comprise those rod-shaped bacteria which produce water-soluble phenazine pigments, regardless of the solubility of the pigments, or water-soluble, fluorescent pigments, or both. Since these pigments apparently play a significant rôle in the life of the bacteria which produce them, the proposed classification would be much more rational from a biochemical and physiological point of view. Bacteria producing pigments of a conspicuously different chemical nature should be excluded from the genus *Pseudomonas*.

BERLAND, A. K. (1942.) Isolation of *Bacterium friedländeri* from a case of septicæmia in a sucking pig.—*Aust. vet. J.* 18. 241-243. 223

A virulent strain of *Bact. friedländeri* was isolated in pure culture from the heart blood of a fortnight-old sucking pig, one of seven among two litters believed to have died from infection with this organism. Lameness was first observed by the owner and death took place within about 12 hours. The P.M. examination of the case from which the strain was derived suggested a septicæmia with a tendency for the organism to localize in the lungs and joints. This appears to be the first record of disease among pigs due to this infection.

—D. A. GILL.

STUART, C. A., VAN STRATUM, E., & RUSTIGIAN, R. (1945.) Further studies on urease production by *Proteus* and related organisms.—*J. Bact.* 49. 437-444. [Authors' conclusions copied verbatim.] 224

Conditions of the test, such as amount of medium, size of inoculum, diameter of the tube, and especially temperature of incubation, may markedly alter the speed of urease production by *Proteus* organisms. The relationships of *Proteus* to other genera and species in the family *Enterobacteriaceae* with regard to urease production can be studied in weakly buffered urea medium. In strongly buffered urea medium under the proper conditions *Proteus* can be differentiated from all other members of the family. A rapid test to differentiate *Proteus* from other organisms in the family has been devised.

RUSTIGIAN, R., & STUART, C. A. (1945.) The biochemical and serological relationships of the organisms of the genus *Proteus*.—*J. Bact.* 49. 419-436. [Authors' conclusions copied verbatim.] 225

The genus *Proteus* is a relatively homogeneous group biochemically, and on this basis can be divided into four species—*P. vulgaris*, *P. mirabilis*, *P. morganii*, and *P. rettgeri*. The first two species could be combined into one, *P. vulgaris*, as in the British system for taxonomic simplification. Urease production for all species and small gas volumes, except with *P. rettgeri* which usually produces acid only, are two cardinal physiological criteria of the genus. Gelatin liquefaction and fermentation of glucose and sucrose but not lactose do not satisfactorily delineate the genus *Proteus*. The genus *Proteus* is serologically heterogeneous, although common antigens are frequently encountered among the different species. It is recommended that *Proteus ammoniae* and *Proteus americanus* be considered as variants of *P. mirabilis*, and that *Proteus hydrophilus*, *Proteus ichthyosum*, *Proteus pseudovaleriei*, and *Proteus bombycis* be excluded from the genus *Proteus*. It is recommended that the epithet "*morganii*" be employed solely for *Proteus morganii* (Morgan's bacillus number 1) as described by Morgan and Ledingham.

ROBINOW, C. F. (1944.) Cytological observations on *Bact. coli*, *Proteus vulgaris* and various aerobic spore-forming bacteria with special reference to the nuclear structures.—*J. Hyg., Camb.* 43. 413-423. 226

P. confirms the existence of chromatinic structures, going through a regular cycle of division, in the cells of *Bacterium coli* and *P. vulgaris*, and believes that they are nuclear in nature. In very young growing cells chromatinic structures increase in size and give rise to short, often dumb-bell shaped rods, which multiply by splitting lengthwise, in a plane more or less parallel with the transverse axes of the bacteria.

A single cell of *Bact. coli* or *P. vulgaris* contains one chromatinic body, or one or two pairs of them, representing primary and secondary division products. Few bacteria in young cultures are single cells. By fixation through agar with Bouin's solution and brief staining with Giemsa solution, it can be shown that young bacteria consist of two, three or four separate cells.



Plasmolysing treatment of *Bacillus megatherium*, by inducing the component protoplasts to shrink away independently from the outer supporting cell-wall, shows that the individual organism is composite in structure.

This article is illustrated by numerous photographs showing the nuclear material in various stages of division.—I. W. BROCKLEHURST.

GILLILLAND, J. R., & VAUGHN, R. H. (1943.) Biochemical characteristics of pigmented coliform bacteria.—*J. Bact.* 45. 499-507. 227

Twelve members of the genus *Escherichia* and three members of the genus *Aerobacter* isolated from water, soil and sawdust were studied by qualitative and quantitative biochemical methods. The majority of the cultures produced pigment when grown at 19°C. but not when incubated at 37°C. or 39°C.

From the taxonomic point of view no importance can be attached to the production of a pigment by a coliform organism.—J. E. LANCASTER.

SEVERENS, J. M., ROBERTS, E., & CARD, L. E. (1944.)

A study of the defense mechanism involved in hereditary resistance to pullorum disease of the domestic fowl.—*J. infect. Dis.* 75. 33-46. 228

Experiments were carried out on Single Comb White Leghorn chicks which showed considerable resistance to *Salmonella pullorum* infection and on Rhode Island Red chicks which were very susceptible to such infection. As a result of artificially infecting newly hatched chicks *per os* and subcutaneously with large doses of *S. pullorum*, the S.C.W.L. chicks were completely resistant at five days of age, while the R.I.R. chicks failed to show such complete resistance until the 12th-13th day.

Examination of the faeces for bacteriophage by methods used by the authors showed that there was little quantitative variation. Examination of the blood of young chicks demonstrated that there was a rapid increase in the number of circulating lymphocytes during the first few days after hatching and that this increase occurred more rapidly in the S.C.W.L. chicks. Phagocytic action of the lymphocytes was found to occur in citrated blood. X-ray radiation of chicks caused a reduction in the number of lymphocytes and a consequent reduction in chick immunity.

The authors showed that the spleens of resistant chicks are slightly larger than those of susceptible chicks. The resistance of S.C.W.L. chicks was reduced by removal of the spleen.—ANTHONY BUXTON.

GOLUBEV, I. E. (1941.) *Techenie brutseleznogo infektsii u loshadei v eksperimental'nykh i estestvennykh usloviyakh.* [The course of brucella infection in horses under experimental and natural conditions.]—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [Diseases of Horses.] pp. 110-115. 229

Observations were made in different parts of Russia for several years on spontaneous brucella infection in horses. In G.'s experience the disease is manifested not only by generally recognized symptoms such as bursitis, poll evil and arthritis but also by general weakness, lassitude, heart insufficiency, nervous symptoms, alopecia, dermatitis, icterus, undulant fever, etc. Accurate diagnosis is impossible without serological or allergic examination. About 75% out of 335 reactors showed no clinical symptoms on first examination. The clinical symptoms are not permanent, the period for which they may be observed varying from a few days to weeks or months. The withers and poll were frequently affected in heavy horses but only occasionally in trotters, Don horses and thoroughbreds. In G.'s experience, brucella infection does not cause abortion

or post-parturient complications, although infertility was often observed among reactors.

Data are given on the course of brucellosis in experimentally and spontaneously infected foals and mule-foals. The incubation period in experimentally infected foals depends on the route of infection. Agglutinins up to a titre of 1:50 appear on the 5th-10th day, increasing after a fortnight to 1:200-1:1,600 and gradually disappearing after 2-4 months. 180 days after artificial infection no agglutinins were revealed in the sera of six infected foals, nor were any changes found on P.M. examination. Similar observations were made on foals born from infected mares with clinical symptoms. Although in some agglutinins were present during the first 13-27 days, these disappeared after 30-90 days. None of the 194 foals born from infected mares reacted after six months. G. concludes that it is best to wean foals born of infected mares.—A. M.

MITCHELL, C. A., & GWATKIN, R. (1945.) The relationship of oestrin to colonization of *Brucella abortus* in calves.—*Canad. J. comp. Med.* 9. 16-17. 230

In tests on an immature heifer calf there was no evidence that the injection of oestrin (theelin) increased the capacity of *Brucella abortus* to become localized in the undeveloped udder.—P. J. G. PLUMMER.

GORRIE, C. J. R. (1943.) A note on the diagnosis of ovine enterotoxaemia.—*Aust. vet. J.* 19. 89-91. 231

*Clostridium welchii* Type D toxin was occasionally demonstrated in various portions of the large intestine of cases clinically resembling enterotoxaemia, even when it was not demonstrable in the small intestine. G. therefore recommends that in cases of suspected enterotoxaemia the contents of the large intestine should be examined when there is no evidence of toxin in the ileal contents. [It is not clear whether G. regards the toxin as having developed in the large intestine or as having been transported from the small intestine by peristalsis.]—A. W. TURNER.

GUGGENHEIM, K. (1944.) Investigations on the dehydrogenating properties of certain pathogenic obligate anaerobes.—*J. Bact.* 47. 313-321. 232

Washed suspensions of *Clostridium botulinum*, *Cl. parabotulinum* and *Cl. welchii* were tested for dehydrogenase activity in a wide variety of substrates such as organic acids, alcohols, carbohydrates and amino acids. The organisms attacked the large majority of the substrates and there was no significant difference between the species.

By the use of a variety of poisons, the mechanism of dehydrogenation was studied. Among the poisons used were potassium cyanide, arsenic, sodium fluoride, copper, iron and manganese. The metals inhibited uniformly above a certain threshold concentration. Below this level, iron and manganese could either inhibit or stimulate according to the substrate tested. The results differed from those obtained in similar work with *Cl. sporogenes*. It was therefore concluded that corresponding dehydrogenases from different species may show specific characters; the dehydrogenases of a single species of bacterium can, moreover, be similarly differentiated.—J. KEPPIE.

\* MASCHMANN, E. (1937.) Über Bakterienproteasen. II. [Bacterial proteases. II.]—*Biochem. Z.* 295. 1-10. 233

\* MASCHMANN, E. (1938.) Über Bakterienproteasen. III. Die Proteasen des *B. perfringens*. IX. Die Anaerobiase der Gasbrandreger. [Bacterial proteases. III. The proteases of *Clostridium welchii*.



IX. The anaerobiase of *Cl. histolyticum*.]—*Ibid.* 295. 351-368 & 297. 284-296. 234

[Absts. from absts. in *Biol. Abstr.* 12. 774, 698 & 1188.]

II. In a study of a number of anaerobic organisms, *Cl. welchii* was found to be the most active protease producer. In a culture of this organism a few hours old were found di- and amino-polypeptidases and two enzymes, one that split gelatin, but not egg albumin, casein or fibrin, and another that split clupein only after supplementation with sulphhydryl.

III. Methods were described for separating and concentrating the gelatin-splitting and clupein-splitting enzymes from a culture of *Cl. welchii*. Cysteine and HCN inhibited the enzymatic action of highly purified gelatin protease to some extent; Cu and Hg salts inhibited it strongly. Ascorbic acid, hydrazine and odo-acetic acid had no effect. Attempts to increase the activity of the enzyme were unsuccessful.

IX. M. described the separation and purification from a culture of *Cl. histolyticum* of the gelatin-splitting enzyme (collagenase) and the clupein-splitting enzyme (anaerobiase). The anaerobiase attacked casein and gelatin slightly but clupein and peptone not at all. The addition of cysteine increased its action on casein and gelatin greatly and its action on clupein and peptone very slightly. When a separated thermostable fraction was also added, the action on gelatin and casein was increased slightly and the action on clupein and peptone increased considerably.

MASCHMANN, E. (1938.) [Activation of peptidases of anaerobic bacteria.]—*Naturwissenschaften*. 26. 791-792. [Abst. in *Brit. Chem. Physiol. Abstr.* AIII. January. p. 198. (1939), copied verbatim.] 235

Peptidases of anaerobic bacteria are appreciably activated by Fe<sup>2+</sup>, more by ascorbic acid + Fe, and very strongly activated by cysteine + Fe. In some culture filtrates the dipeptidases are activated by cysteine alone. The activity of the peptidases of anaerobic as well as of aerobic bacteria is not noticeably affected by N<sub>2</sub>H<sub>4</sub>, NH<sub>4</sub>OH, NaHSO<sub>3</sub>, semicarbazide, or phenylhydrazine. Inhibition with HCN is reversible. No active peptidases have been found in Merck's papain and cathepsin containing extracts of dried liver which will hydrolyse leucylglycine and leucylglycylglycine at pH 7.2 or 7.8.

TURNER, A. W., & RODWELL, A. W. (1943.) The epsilon toxin of *Cl. welchii* Type D. 1. Proteolytic conversion of  $\epsilon$  prototoxin into  $\epsilon$  toxin by trypsin and other proteases. 2. Mechanism of its development in cultures through the action of extracellular proteinases upon  $\epsilon$  prototoxin.—*Aust. J. exp. Biol. med. Sci.* 21. 17-25 & 27-36. 236

1. Contrary to the conclusions of BOSWORTH & GLOVER [V. B. 7. 160], the authors found that culture filtrates of *Clostridium welchii* Type D could be "activated" (i.e., augmented in specific toxicity) not only by trypsin but by many other proteolytic enzyme preparations from animal, plant and microbial sources. Culture filtrates of lowly toxic and highly toxic strains vary relatively little in combining power, which does not increase after enzymatic "activation", although the proportionate increase in toxicity ("activation ratio," A.R.) after "activation" may range, according to strain, as considerably as 1-500. This and other evidence strongly suggests that the phenomenon of "activation" by trypsin consists in the proteolytic conversion of an atoxic substance (" $\epsilon$  prototoxin") into normal  $\epsilon$  toxin and not, as Bosworth and Glover postulated, in the formation of a hypertoxin complex of  $\epsilon$  toxin and trypsin.

2. In cultures of *Clostridium welchii* Type D at 7°C.,  $\epsilon$  toxin increases to a maximum at 3-5 days,

although active growth ceases after only 6-8 hours. During the growth period an atoxic precursor of  $\epsilon$  toxin (" $\epsilon$  prototoxin") is excreted into the medium, together with intrinsic proteinases which bring about a slow enzymatic "activation". As this activation proceeds, the activation ratio gradually falls to a stable value which is more or less characteristic of the strain and is dependent mainly upon its capacity to secrete proteinase; the A.R. of fully developed culture filtrates is related exponentially to the proteinase activity. Hence most crude "toxins" contain a mixture of  $\epsilon$  prototoxin and  $\epsilon$  toxin in proportions more or less characteristic of the strain in a given medium and they can therefore be "activated" by trypsin and other suitable extrinsic proteinases to the theoretical maximum. A brief study of the proteinases of *Cl. welchii* Type D indicated that two distinct proteinases occur, corresponding to the collagenase and anaerobiase described by MASCHMANN [see preceding absts.] in cultures of Type A, both enzymes being concerned in autogenous activation. It was shown that prototoxin is antigenic and gives rise to  $\epsilon$  antibody; when treated with formaldehyde, it is not observably inferior in antigenicity to formalin toxoid and therefore young cultures that have merely completed their growth period, or cultures from very poorly toxigenic strains are probably equally effective as antigens, provided their combining powers are equal.

PICKETT, M. J. (1943.) Studies on the metabolism of *Clostridium tetani*.—*J. biol. Chem.* 151. 203-209. 237

Certain aspects of the metabolism of four strains of *Cl. tetani* were studied and washed suspensions were shown to have no effect on the majority of the amino acids known to be essential for their growth. It is therefore suggested that these amino acids are required for conversion into cell substance without their structure being much altered. Among the amino acids which were attacked and dehydrogenated were histidine, serine and threonine, which are not essential for growth but are merely stimulatory.—J. KEEPIE.

BIRGE, R. F., & RISER, W. H. (1945.) Canine histoplasmosis. Report of two cases.—*N. Amer. Vet.* 26. 281-287. 238

Histoplasmosis is described as an infectious disease caused by the fungus *Histoplasma capsulatum*. It is a slowly progressive disease and usually fatal. Most of the clinical symptoms are associated with the reticulo-endothelial system. Necropsy shows that the wall of the intestine is thickened to about twice the normal size; the mucosa is coarsely pebbled. Microscopical examination shows that the epithelial surface of the mucosa of the small intestine and colon is desquamated. The mucosa and submucosa are thickened because of diffuse infiltration by numerous reticular cells laden with tiny phagocytosed bodies having the typical morphology of *Histoplasma capsulatum* in its yeast form. Diagnosis may be made by biopsy or culture. Histoplasmosis should be considered in the differential diagnosis when dogs show chronic debility, slight fever, splenomegaly and leucopenia, with ascites or diarrhoea.—C. H. S.

ASHBURN, L. L., & EMMONS, C. W. (1945.) Experimental Haplosporangium infection.—*Arch. Path.* 39. 3-8. 239

For purposes of studying the lesions caused by *Haplosporangium parvum*, experimental infections were set up in mice, g. pigs, rats, monkeys, hamsters and goats. Of these animals, mice were the most satisfactory and the lesions in them were studied, after infection by intranasal instillation of spores under ether anaesthesia. The lesions grew slowly for about four months; they were round and measured up to 200 $\mu$ . Giant cells were



present in fairly large numbers and fungus cells measuring up to  $35\mu$  were present. The lesions occurred most frequently in the medial half of the pulmonary lobes, these portions of the lung being consolidated by closely grouped granulomata. Mice inoculated with *Haplosporidium parvum* were as susceptible three weeks later to inoculation with *Coccidioides immitis* as were control mice.—T. E. GIBSON.

HINDMARSH, W. L., WEBSTER, W., & STEWART, D. F. (1943.) Observations on recent outbreaks of contagious bovine pleuro-pneumonia in the Hunter River district of N.S.W. 1. Field observations. 2. Laboratory findings.—*Aust. vet. J.* 19. 126-134 & 134-141. 240

1 & 2. These articles are concerned with a widespread outbreak of bovine contagious pleuro-pneumonia in the Hunter Valley district of New South Wales in 1940, following the introduction from Queensland, where the disease is endemic, of some thousands of store cattle for fattening. The first article describes the outbreak and the methods successfully used to control and eliminate the disease and gives much useful information regarding the handling, bleeding, identification and inoculation of large herds of semi-wild cattle, concluding with an estimation of the financial loss through death and the costs of the control measures. The second article describes the use of the complement-fixation test in controlling the outbreak and discusses its interpretation. The test proved extremely valuable in detecting non-clinical cases, but cattle in the incubation period apparently failed to react. Such non-reactors might soon show acute clinical symptoms: in one case only six days elapsed between negative reaction and acute symptoms.

Evidence is also adduced as to the length of the incubation period, the rate at which sequestration may occur and the rate of decline of complement-fixation following inoculation or recovery.—D. A. GILL.

LICHSTEIN, H. C., & SOULE, M. H. (1944.) Studies of the effect of sodium azide on microbial growth and respiration. I. The action of sodium azide on microbial growth. II. The action of sodium azide on bacterial catalase. III. The effect of sodium azide on the gas metabolism of *B. subtilis* and *P. aeruginosa* and the influence of pyocyanine on the gas exchange of a pyocyanine-free strain of *P. aeruginosa* in the presence of sodium azide. IV. The effect of sodium azide on glucose fermentation and lactic acid production by streptococci and lactobacilli.—*J. Bact.* 47. 221-230, 231-238, 239-251 & 253-257. 241

I. Sodium azide ( $\text{NaN}_3$ ) added to infusion agar exerts a marked bacteriostatic action on Gram-negative bacteria as a group. Of 41 assorted strains of Gram-negative bacteria, only three strains of *Pseudomonas aeruginosa* grew in the presence of 0.03%  $\text{NaN}_3$ . Gram-positive bacteria were as a rule resistant to this concentration, important exceptions being *Bacillus anthracis*, *B. subtilis*, *B. megatherium* and *Staphylococcus citreus*, which were completely inhibited, and *Staph. aureus*, *Staph. albus* and *Corynebacterium diphtheriae*, which were moderately resistant. Azide incorporated in broth media produced substantially the same effect as in solid media, with the exception that *Ps. aeruginosa* was much more susceptible to the inhibitory effect of the chemical in broth.

Three of eight strains of streptococci were found to grow well in a concentration of 0.25%  $\text{NaN}_3$ . Twelve strains of facultative anaerobes were grown under anaerobic conditions on infusion agar containing  $\text{NaN}_3$ . In general, the results were the same as those obtained under aerobic conditions, except that *Staph. albus*, *Staph. aureus* and *Ps. aeruginosa* were more sensitive in the absence of free oxygen.

Aeration of  $\text{NaN}_3$  broth cultures of a pyocyanine-producing strain of *Ps. aeruginosa* increased the growth of the organism in the presence of the chemical. Washing of the inoculum resulted in decreased growth of *Ps. aeruginosa* in the presence of  $\text{NaN}_3$ , suggesting that washing removed some metabolic product of the bacteria which may have been associated with the resistance of the organism to the chemical.

II. Sodium azide in concentrations of 0.01 and 0.02% markedly inhibited the catalase activity of suspensions of washed bacteria and of actively growing cells, with the exception in the latter case of *Ps. aeruginosa*.

The organisms most resistant to the action of  $\text{NaN}_3$  were the streptococci, the sporing anaerobes and the lactobacilli; these are the bacteria which lack the enzyme catalase. Apparently  $\text{NaN}_3$  does not destroy catalase, but forms a reversible combination, although the amount of reversibility decreases with increased time of exposure to the chemical. The introduction of catalase into broth before its inoculation with bacteria does not affect the sensitivity of the bacteria to  $\text{NaN}_3$ .

Attempts to demonstrate the presence of hydrogen peroxide in plain broth and  $\text{NaN}_3$  broth cultures of bacteria were unsuccessful.

III. The results obtained in the two previous studies suggested the possibility that sodium azide interferes with aerobic respiration. A quantitative study of the gas exchange by bacteria growing on media containing  $\text{NaN}_3$  was therefore carried out. There was a marked inhibition of the oxygen consumption of *B. subtilis* and *Ps. aeruginosa* and a reduction in growth in the presence of critical concentrations of  $\text{NaN}_3$  (0.05% for *Ps. aeruginosa* and 0.003% for *B. subtilis*). The respiratory quotients found at these concentrations suggested that the respiration of the germs was almost entirely anaerobic.

The addition of pyocyanine to cultures of a pyocyanine-free strain of *Ps. aeruginosa* in broth containing  $\text{NaN}_3$ , resulted in the oxygen consumption returning to normal and the respiratory quotient remaining constant. Apparently the pigment counteracts the azide in some manner, possibly acting as an oxygen transfer catalyst and taking the place of the respiratory enzymes which are sensitive to sodium azide.

IV. The enzyme system involved in the conversion of glucose to lactic acid by streptococci and lactobacilli is resistant to sodium azide. Since the conversion of glucose to lactic acid constitutes the major source of energy of those germs in the presence of glucose, it is possibly an important reason for their marked resistance to the growth-inhibiting action of sodium azide.—I. W. BROCKLEHURST.

See also abstrs. 297, 334, 356 (cocci), 364 (anthrax), 272, 369, 361, 363 (TB), 297 (*Pseudomonas*), 287 (*Corynebacterium*), 266, (pasteurella), 335 (coliform organisms), 266, 287, 335, 352 (salmonella), 297, 358, 361, 365 (brucella), 289, 358 (clostridia), 358 (necrobacillosis, *Trichophyton*), 331 (bacteriophage), 324 (bacterial enzymes and toxins).

#### DISEASES CAUSED BY PROTOZOAN PARASITES

CHANG, S. L. (1945.) Studies on *Entamoeba histolytica*. V. On the decrease in infectivity and pathogenicity for kittens of *E. histolytica* during prolonged in vitro

cultivation and restoration of these characters following encystment and direct animal passage.—*J. infect. Dis.* 76. 126-134. 242



*E. histolytica* may lose its infectivity and a degree of its pathogenicity for kittens after prolonged cultivation without encystment. Encystment restores the infectivity of the non-infective cultural strains. C. points out that distinction should be made between infectivity and pathogenicity when the virulence of cultural strains of *E. histolytica* is being studied.

—C. HORTON SMITH.

WESTPHAL, A., & MARSCHALL, F. (1941.) Amöbenruhr bei Katzen auf bakterieller Grundlage. [The bacteriological basis of amoebic dysentery in cats.] —*Virchows Arch.* 308. 22-44. [Abst. from abst. in *Bull. Inst. Pasteur.* 42. 60.] 243

The intestines of rabbits are normally an unsuitable habitat for *E. histolytica*, but attempts were made to modify the intestinal conditions of these animals by feeding grain and bread and to infect them with amoebic dysentery by inoculating them either with amoebic cysts by stomach tube, or with vegetative forms tracheally. Six strains of amoebae were used, but organisms were never detected in the lumen of the caecum or other portions of the intestine. In one case, however, an acute dysentery was produced with associated necrosis of the mucous membrane of the caecum. Numerous amoebae were present in scrapings of the caecotic areas and some of the organisms contained erythrocytes. Histological investigations showed that the necrotic lesions were produced by bacterial action and that the amoebae were confined to the necrosed areas and appeared to be secondary invaders.—U. F. R.

DEVLOO, S. (1940.) Enkele klinische gegevens omtrent trichomonas-infectie bij runders. [Clinical data in relation to bovine trichomoniasis.] —*Vlaam. Diergeneesk. Tijdschr.* 9. 37-39. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* May 31st. 259. (1940.)] 244

During the past years trichomonad infection has become widely distributed near Jeper, mainly through lack of care in mating. D. quotes from a stud-book, according to which 34 cows from 24 different byres were sent to one infected bull. Clinical symptoms and slaughter results are given.—C. HORTON SMITH.

HASSELMANN, H. (1938.) Ueber die Feststellung und Bekämpfung der Trichomonadenseuche des Rindes. [Diagnosis and control of bovine trichomoniasis.] —*Inaug. Diss., Hanover.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* May 31st. 259. (1940.)] 245

In the Eder district and the Eichsfeld border there was a severe outbreak of bovine trichomoniasis on all the farms which had sent cows to be served by a communal bull. Out of 486 animals examined, 95.7% were infected, a large majority (82.8%) chronically. There were 35 cases of abortion in the first five months of pregnancy. On two occasions the foetus was found with the vagina completely enveloped in mucus and pus. Trichomonads were found in 8.5% of 378 microscopic examinations, but in culture experiments by Wagner's method, 29.5% of 149 vaginal discharges were positive. Vaginal irrigation proved a more effective treatment than insufflation.—C. HORTON SMITH.

JENNES, R. N. T. W. (1945.) Trypanosoma congolense (Borden) infection of cattle: some aspects of the treatment problem.—*Vet. Rec.* 57. 366. 246

The lesions of this infection are stated to be a parenchymatous degeneration of almost all essential organs. This can be ascribed to infarction caused by thrombosis of the arterioles and venules, the thrombosis being due to hyperplasia and fibrosis of the coat of the blood vessels, and an alteration of the endothelial cells to a macrophage type.

Trypanocidal drugs are not curative in the later stages of the disease, except for phenanthridinium

which may act by stimulating tissue growth and repair. [The statement that only young animals recover from this infection is questionable.]—U. F. RICHARDSON.

JACOBS, H. R. (1945.) Immunization against malaria. Unsuccessful attempts to increase resistance of ducklings to *Plasmodium jophurae* infections by previous injections of materials containing the Forssman antigen.—*Amer. J. trop. Med.* 25. 151-153. 247

Most animals known to have the Forssman antigen in their tissues belong to the group of vertebrates that are not subject to malaria. There appears to be a high correlation between these two apparently unrelated phenomena; with one exception, the chicken, there is an absence of malaria in animals possessing the antigen. With the exception of the chicken, where it occurs in both erythrocytes and organs, the hapten usually occurs only in the organs. In sheep and goats the hapten occurs only in the erythrocytes. The present work sets out to investigate the effect of prior injections of tissue material containing the Forssman hapten on susceptibility to malaria. Preliminary treatment of ducklings with materials containing the hapten, however, aroused no kind of defence against *P. lophurae* infection.

—C. HORTON SMITH.

ADLER, S., & TCHERNOMORETZ, J. (1943.) [The development of gametocytes from extra-erythrocytic forms in *Plasmodium gallinaceum*.] —*Harefuah.* 25. 83. [In Hebrew.] [Abst. from English summary.] 248

Adult fowls were subjected to intense quinization (injections of 150 mg. quinine hydrochloride daily) shortly after inoculation with *Plasmodium gallinaceum* by the bites of mosquitoes, *Aedes aegyptii*. Quinization was stopped when the red cells showed a sufficient infection with small non-pigmented parasites. The extra-erythrocytic forms were the only possible source of these parasites in the red cells. The development of the parasites in the red cells after cessation of quinine was studied. It was found that young gametocytes could be recognized 27½ hours after the cessation of quinine, approaching their maximum size before the first cycle of erythrocytic schizogony was completed. It is therefore proved that extra-erythrocytic forms produce merozoites which invade red cells and develop directly into gametocytes.

SMITH, H. C., & HOWELL, D. E. (1945.) Hemoglobin tests on 175 cases anaplasmosis.—*Vet. Med.* 40. 272-273. 249

In connexion with a severe outbreak of anaplasmosis in Oklahoma, in which animals were treated experimentally, observations were made on the haemoglobin content of the blood. It is suggested that the extent of haemoglobin loss is correlated with the chances of the animal's survival. Only 27% of animals having less than 30% haemoglobin lived, but when the reading was over 30% the recovery rate varied from 42-96.1%, the latter figure being given by animals in which the haemoglobin had been reduced to 50%.

From this it is argued that drugs should be tested on animals with below the 30% haemoglobin level, as these have little chance of survival. In a résumé of treatment in animals with 35% haemoglobin, it is claimed that neosalvarsan [= neo-arsphenamine] and glucose, and trypanamide and glucose gave 100% recovery.—U. F. RICHARDSON.

HUTSON, L. R. (1945.) Observations on canine leptospirosis in Antigua.—*Vet. Med.* 40. 139-140. 250

Cases of canine leptospirosis occurred in Antigua from January to March in 1943 and 1944, being confined, except for one puppy, to male, adult dogs. Both the icteric and the haemorrhagic type of case occurred



and serological evidence suggested *L. canicola* infection. As treatment proved unsuccessful, an attempt was made to immunize, a bivalent *canicola-icterohaemorrhagiae* vaccine being used. Two animals died out of 27 vaccinated, one seven days and the other 63 days after the second vaccine injection. In the latter case there was a suspicion that infection was derived from a carrier female during coitus.—U. F. RICHARDSON.

JONES, T. C., ROBY, T. O., DAVIS, C. L., & MAURER, F. D. (1945.) Control of leptospirosis in war dogs. —*Amer. J. vet. Res.* 6. 120-128. 251

In order to control leptospirosis in the war dog reception centre at Front Royal, a macroscopic agglutination test was carried out for each dog as soon as possible after its arrival. Any animal whose serum agglutinated at titres of 1:100 or higher was slaughtered autopsied and attempts were made to demonstrate the presence of leptospira by culture in Verwoort's medium, inoculation of laboratory animals, dark-field examination of kidney suspensions and examination of stained sections.

Fifty-eight animals, 1.33% of the total received, gave positive reactions and 3.11% gave reactions at titres above 1:10 but below 1:100. It is suggested that the low-titre reactions represented a previous

infection. The low incidence of infected animals and the small number of clinical cases encountered indicate that canine leptospirosis is not as prevalent as had been feared.

The results of animal inoculation were negative and cultural methods yielded typical leptospira in only three dogs out of 27, the strains being all *L. canicola*. Silver-stained kidney sections contained leptospira in six cases, but they could not be found in stained sections from the three animals found positive by culture.

No significant lesions were detected in organs other than the kidney. In 44 out of 48 animals, the kidneys showed scattered white or grey foci principally in the cortex and in addition, more than half the kidneys also contained small haemorrhagic lesions scattered through the parenchyma.

Microscopically the changes in the kidneys consisted of a subacute form of interstitial nephritis, the interstitial tissue being infiltrated with lymphocytes, plasma cells, monocytes and a few polymorphonuclear cells. These kidney lesions are considered to be characteristic.—U. F. RICHARDSON.

See also absts. 336, 358, 360 (trypanosomes), 363 (leishmanias), 337 (Eimeria), 338 (plasmodia), 264 (theileria).

#### DISEASES CAUSED BY VIRUSES AND RICKETTSIA

— (1943.) Declina um dos flagelos da pecuária. [Decrease in the incidence of bovine paralytic rabies in Brazil].—*Bol. Minist. Agric., Rio de J.* 32. No. 6. 100-101. 252

It is stated that bovine paralytic rabies is decreasing in Brazil as a result of systematic vaccination of herds, isolation of affected animals and the campaign against blood-lapping bats. [No figures are given.]—G. J.

MANOUELIAN, Y. (1942.) Démonstration expérimentale de la virulence rabique des filets du plexus solaire et des endoneurocytes. [Experimental demonstration of the virulence of the nerves of the solar plexus and of the endoneurocytes in rabies].—*Ann. Inst. Pasteur.* 68. 550-552. 253

The distribution of rabies virus in the sympathetic nervous system has not received the attention it deserves. M. describes the changes in the solar plexus of dogs dead from "street virus" and confirms the presence of Negri bodies in the cytoplasm of the endoneurocytes. He successfully transmitted rabies with nerve fibres from the solar plexus.—D. W. MENZIES.

CRUVEILHIER, L., & VIALA, C. (1942.) Les vaccinations antirabiques à l'Institut Pasteur en 1941. [Antirabic vaccination at the Pasteur Institute, Paris, during 1941].—*Ann. Inst. Pasteur.* 68. 545-547. 254

Of the 214 persons vaccinated against rabies, 100 had been bitten by stray dogs, 18 by stray cats, 12 by rats, 53 by other dogs and 31 by other cats. In only one animal was rabies confirmed. No deaths occurred among the persons vaccinated.—D. W. MENZIES.

MORRIS, R. C. (1942.) Widespread rabies among wild dogs on the Billigirirangan Hills (S. India).—*J. Bombay nat. Hist. Soc.* 43. 100. 255

M. reports an outbreak of rabies in wild dogs which had attacked human beings, cattle and domestic dogs. The wild dogs actually entered human habitations and attacked people. The brains of two wild dogs were examined and reported positive by the Pasteur Institute. Other wild dogs showing symptoms were killed but the brains were not examined.—M. C.

WAY, C. (1944.) Rabies control.—*Cornell Vet.* 34. 328-331. 256

W. points out the reasons for the lack of progress in the control of rabies in the U.S.A., with special reference to New York State, and states the minimal requirements for successful control.

Rabies is not legislatively under control by the authorities concerned with the diseases of domestic animals; dogs are not classed as domestic animals owing to certain selfish interests [this important point is necessarily somewhat cryptic to non-Americans] and no control over stray dogs is exercised. Money from the purchase of dog licences, which might well be used for cost of rabies control, is added to the general revenue of the state. The work of the combined committee of the American Veterinary Medical Association, the American Hospital Association and other bodies [see *V. B.* 12. 151] has been stultified and blocked by "selfish interests". Vaccination was a poor control tool up to 1940, but since the advent of the Habel mouse test, vaccines have become much more effective, so that to-day they can be used with confidence to make dogs really immune.

Successful control requires three things: rabies must be controlled by the animal disease control officials in State employ, all dogs must be licensed and the licence revenue used for rabies control and licensed dogs must be vaccinated. An implied duty of the State officials is the elimination of stray dogs.—J. E.

FRIEDELMANN, U., HOLLANDER, A., & BORNSTEIN, S. (1944.) Studies on virus immunity. Experiments with the viruses of rabies and equine encephalomyelitis.—*J. Immunol.* 48. 247-257. 257

The authors investigated the mechanism of immunity to rabies and E.E. Rabies virus and its antibody combine directly and in the absence of tissue cells, even if the immune serum is highly diluted. E.E. virus and its antibody, however, do not combine *in vitro* or in the cell-free intraventricular fluid, if the immune serum is diluted to more than 1:4.

Quantitative studies show that this virus is neutralized in the substance of the brain, where antibody is



240 times more potent than it is in the intraventricular fluid. This is explained by assuming that the antibody coats the brain cell surface and thereby prevents the virus from entering the cells.—I. W. BROCKLEHURST.

SMITH, M. G., BLATTNER, R. J., & HEYS, F. M. (1944.) The isolation of the St. Louis encephalitis virus from chicken mites (*Dermanyssus gallinae*) in nature.—*Science* 100. 362-363. 258

From the epidemiology of encephalitis in St. Louis county, the authors postulated the existence of an endemic focus, which was shown to be fowls. *D. gallinae*, which do not bite man, were examined and found to contain a virus which, by serological tests, was shown to be the known strain of St. Louis encephalitis virus.—G. B. S. HEATH.

LLERAS, A. S., & FIGUEROA, L. (1942.) Aislamiento de un virus de un caballo atacado de "peste loca" en Bogotá. [Isolation of encephalomyelitis virus from a horse in Bogotá].—*Bol. Inst. Nac. Hig. Samper Martinez, Bogotá*. No. 8. pp. 3-15. 259

From results obtained when laboratory animals (sheep, rats, mice, dogs, goats, cats) were inoculated intracerebrally and intraperitoneally with material obtained from cases of E.E. in Bogotá, the authors consider the virus encountered to be a separate entity, distinct from Western and Eastern types of virus. Antisera of Western and Eastern type virus, with normal horse serum as a control were used to study the immunology of the Bogotá type of disease. A review of the literature is given, and the danger of human infection stressed.—G. B. S. HEATH.

SAMPER, B., & LLERAS, A. S. (1943.) Nuevas observaciones sobre una cepa del virus de la encefalomyelitis equina. [Further observations on a strain of the equine encephalomyelitis virus].—*Bol. Inst. Nac. Hig. Samper Martinez, Bogotá*. No. 10. pp. 5-8. 260

In a previous paper [see preceding abstr.], a strain of E.E. virus was described identical with the Venezuelan strain. The virus was preserved for study by the subcutaneous injection of g. pigs every ten days with brain material. By this method, the virus produces death in not more than four days, most frequently on the second day. Titrations were carried out in g. pigs 250-300 g. in weight, using suspensions of the brains of g. pigs killed when moribund, because these showed less variation in resistance than other animals. The titre was  $10^{-7}$  to  $10^{-6}$  whether the route of inoculation was subcutaneous or intracerebral; neither was there any difference between the incubation periods for each route of infection. [KUBES & DIAMANTE—see V. B. 13. 354—found that their strain, presumably a North American strain, was 10 times more active by the intracerebral than by the subcutaneous route.] Apart from horses, pigeons are the only naturally infected animal. Of 21 pigeons inoculated, only five died and then only when given a  $10^{-1}$  dilution. When passaged in pigeons, the infection died out at the third passage. The pigeon is apparently less susceptible to this strain than to the North American strains.—R. M. LOOSMORE.

ISHUKOV, G. K. (1941.) K voprosu o spetsificheskoi profilaktike entsefalomielita loshadei. [Specific prophylaxis of equine encephalomyelitis].—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow*, 1939. [Diseases of Horses.] pp. 56-62. 261

In a study of the prophylaxis of E.E. in Bashkir S.S.R., where the disease has a seasonal character, reaching its peak in August and September, the author found that neither chemotherapy nor hyperimmune or convalescent serum was effective.

Experiments were made under laboratory and later under field conditions with so-called "photovaccines" [prepared by inactivation of E.E. virus with methylene-blue and exposure to light—see MUTOVIN, V. B. 13. 125]. In 69% of rabbits a stable immunity is produced after two injections; this lasts for 88 days and may be prolonged up to 160 days by a third inoculation. Out of 157 horses which were inoculated twice and subsequently infected by the subarachnoid route with lethal doses of E.E. virus, 84.8% were found immune. Out of 82 horses inoculated in the field only one became affected, whereas out of 68 horses in the same area which were not inoculated 10 became affected. During 1938, vaccination with "photovaccines" was performed on the recommendation of the Ministry of Agriculture on 53 collective farms. Although the incidence of E.E. was high during the year 1938, out of 1,225 vaccinated horses none became infected, whereas three non-vaccinated controls contracted E.E. Two of the vaccinated horses were affected after 12 months, whereas out of 323 horses that were not vaccinated, 17 were affected.—A. MOLDAWSKY.

AMFITEATROV, F. Z. (1941.) Kompleks profilakticheskikh i lechenykh meropriyatiy pri entsefalomielite loshadei. [Prophylactic and therapeutic measures against equine encephalomyelitis].—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow*, 1939. [Diseases of Horses.] pp. 52-55. 262

A. recommends for the prophylaxy and therapy of E.E. various improvements with regard to hygiene, as well as the measures suggested in an official memorandum of the Soviet Ministry of Agriculture. Especially emphasized are the necessity of the control of piropasmosis and the addition to each feed of 40 g. salt. A. discusses also the role of NaCl in the metabolism of horses affected with E.E.—A. MOLDAWSKY.

FEDOROV, A. I. (1941.) Patologicheskaya anatomiya pochek pri infektsionnoi anemii loshadei. [The pathology of the kidneys in equine infectious anaemia].—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow*, 1939. [Diseases of Horses.] pp. 28-30. 263

F. emphasizes the importance of kidney examination in the diagnosis of E.I.A., especially in doubtful cases in which piropasmosis or septic processes may be involved. In 40% of 150 P.M. examinations pronounced macroscopic changes were found in the kidneys; such changes were found in 77% of acute cases and 9% of chronic cases. These changes included enlargement of the kidney, erythema and punctate redness under the capsule, fine granulations on the section surface and grey nodes in the cortical substance. Histological examinations were made on kidneys from 800 cases of E.I.A. Changes in the Malpighian bodies included swelling, hyperaemia, proliferation of the histiocytes and lymphoid cells and haemosiderosis of the Bowman's capsules. There was granular and fatty degeneration and sometimes necrosis of the tubular epithelium, with occasional haemosiderosis of the convoluted tubules and in the interstitial tissue there was perivascular, periglomerular and intertubular infiltration with lymphoid cells.

Degenerative and exudative changes characterized the acute cases, and proliferate and sclerotic changes were typical of the chronic cases.—A. MOLDAWSKY.

BRAGA, A. (1944.) Não receptividade de *Dicotyles albirostris* ao vírus da peste suína. [Resistance of peccaries (*Dicotyles albirostris*) to the virus of swine fever].—*Bol. Soc. brasil. Med. vet.* 13. 7-11. 264

Wild pigs of the species *Dicotyles albirostris* injected with S.F. virus show no clinical manifestations of



the disease, nor are they infective to domestic swine, although the virus can be demonstrated in their heart blood 5-8 days after inoculation.—I. W. B.

DELEZ, A. L. (1944.) Studies of the spleens of hyper-immunized and immunized swine.—*Amer. J. vet. Res.* 5. 250-255. 265

Studies have been made on the histology of the spleens of pigs hyperimmunized against swine fever, young pigs recently immunized against swine fever with antiserum and virus, and market-age pigs which had been vaccinated at weaning age. The hyperimmune group comprised 137 animals, the second group 12 weaned pigs and the third group 65 pigs. Bacteriological examination of the spleens was also made and gross changes of structure were noted.

No significant bacteriological infection was found in the spleens and there were no gross lesions typical of swine fever in any of the classes of pigs. Although considerable variation was found in the weights of the spleens in individual hyperimmune pigs, the relation of splenic weight to body weight was approximately the same in each group. The average splenic weight was close to the normal for adult pigs. Considerable variation in weight was noted in the spleens of 40 market grade pigs, but the average weight was slightly less than that of the hyperimmune pigs. There was no evidence, however, that hyperimmunization caused hyperplasia of the spleen. 126 spleens of hyperimmunized pigs were examined histologically and it was found that many showed degeneration of the walls of the blood vessels associated with extensive necrosis of the splenic pulp.

The trabeculae of the spleens showed hyaline changes in the more extensive lesions. There was no evidence that the hyaline material was amyloid. The spleens of recently vaccinated pigs examined 1-4 weeks after vaccination with antiserum and virus showed no histological evidence of swine fever. The spleens of pigs seven months old, which were vaccinated with serum and virus at two months, had a normal histological structure.—T. E. GIBSON.

I. NIKOL'SKII, V. V. (1935.) K voprosu izucheniya etiologii zaraznovo rinita krolikov. [Studies on the aetiology of infectious rhinitis of rabbits.]—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 62-76. 266

II. NIKOL'SKII, V. V. (1935.) K voprosu izucheniya roli fil'truyushchevoya virusa v etiologii zaraznovo rinita krolikov. [Role of virus in the aetiology of infectious rhinitis of rabbits.]—*Ibid.* pp. 77-79. 267

III. LI'IN, A. S. (1935.) Opyty po izucheniyu etiologii infektsionnovo rinita krolikov. [Studies on the aetiology of infectious rhinitis of rabbits.]—*Ibid.* pp. 80-90. 268

I. N. discusses the symptomatology, lesions, bacteriology, control, and prophylaxis of infectious rabbit rhinitis. In investigations in six affected rabbitries, a pasteurilla and a salmonella resembling *S. paratyphi* B were isolated and are regarded as the causal organisms. The disease was observed in an acute, severe form affecting mainly young rabbits and in a chronic form lasting several months with less pronounced symptoms. "Snuffles" were not always present. The chronic cases were often accompanied by pyaemia. Secondary factors, lowering the natural resistance of the animals, are considered to be responsible for the pathogenicity of the organism found. The repeated passaging of pasteurilla increases its virulence. Infection is maintained by chronic cases.

II. Emulsion filtrates from various organs of rabbits which succumbed to natural infection were inoculated into normal rabbits. No disease could be reproduced in them.

III. The author comes to the same conclusions as those reached in I.—A. MOLDAWSKY.

KRUMBIEGEL, E. R. (1944.) Transmission of virus diseases by water.—*J. Amer. Wat. Wks. Ass.* 36. 81-85. 269

Diseases spread by water are usually those in which the agent enters the body by the gastro-intestinal tract and leaves via the faeces and/or urine. To date, poliomyelitis and foot and mouth disease virus have both been isolated from human stools but there is no evidence that the latter has ever been transmitted to man by water.

Sewage is frequently disposed of in ways which may contaminate drinking water. CARLSON *et al.* [*V. B.* 14. 158] showed that activated sludge in amounts as little as 1,100 parts per million inactivated or removed large amounts of poliomyelitis virus after six hours' aeration. The method by which this takes place is not clear.

The effects of water purification on poliomyelitis virus have not yet been adequately investigated. In 1942, CARLSON *et al.* found that sedimentation and sand filtration held back small amounts of virus. Large amounts of alum flocc impregnating the surface layers of the filter so that the rate of flow decreased from 144 ml. per min. to 102 ml. per min. greatly reduced the amount of virus present. Activated charcoal in concentrations of 10, 25 and 50 p.p.m. was effective in removing virus by adsorption. Slightly turbid, artificially contaminated water was rendered non-infective after 21 hours by 4 p.p.m. of chlorine (0.4 p.p.m. sufficed in clean water). A 1:1,650 suspension of virus was not inactivated by 0.5 p.p.m. of chlorine in one-and-a-half hours but was inactivated in four hours. A concentration of 1.5 p.p.m. of chlorine in tap water inactivated the virus in 20 min. and a concentration of 0.55 p.p.m. inactivated it in one hour.

Epidemiological evidence fails to indicate that water is of any importance in the spread of poliomyelitis. In the North Temperate Zone poliomyelitis epidemics occur during the summer and early autumn, rarely in the cold months. There is no logical reason why this is so if the disease is spread by water, since cold exerts no deleterious effect on the virus. Moreover, poliomyelitis epidemics (in contrast to such water-borne epidemics as typhoid fever and dysentery) usually extends to communities irrespective of their water supply. Any theory of the disease being water-spread is therefore not in accordance with known biologic behaviour.—S. M. G.

HILLEMANN, M. R. (1945.) Immunological studies on the psittacosis-lymphogranuloma group of viral agents.—*J. infect. Dis.* 76. 96-114. 270

Neutralizing antisera of high titre and sharp specificity were prepared against the viruses of meningo-pneumonitis, lymphogranuloma venereum and mouse pneumonia (Chicago) by the intraperitoneal inoculation of chickens. The three antisera were used in a study of the relationships of these three viruses and the viruses of psittacosis, ornithosis, human pneumonia, swine fever, feline pneumonia (Baker) and mouse pneumonia (Atherton II).

"Meningopneumonitis and ornithosis viruses were found to be similar to each other and different from the other agents of the group tested. The Chicago and Atherton II strains of mouse pneumonitis also proved to be similar to each other and different from the other agents of the group. Lymphogranuloma venereum virus was found to differ from all other agents tested. None of the other agents tested showed any relationship to the 3 antisera used. The relations established in



the present studies by the serum neutralization test are in agreement with those established on other bases by other workers. These results indicate that neutralization tests with immune chicken sera offer a satisfactory method for studying the relations within and identifying

the members of the psittacosis-lymphogranuloma group."—W. M. HENDERSON.

See also absts. 349, 358 (F. & M. disease), 358, 363 (swine fever), 358 (rabies, E.E.), 362 (fowl paralysis), 342, 343 (venereal granuloma).

## IMMUNITY

ROUYER, M. (1943.) Relation entre la production des bactériophages et la multiplication du *B. megatherium* lysogène cultivé en goutte pendante. [Relation between the production of bacteriophage and the multiplication of lysins of *Bacillus megatherium* cultivated in a hanging drop.]—*Ann. Inst. Pasteur*. 69, 121-123. 271

A technique is described in detail for estimating the relationship between the numbers of bacteriophage particles and bacilli in a hanging drop culture of a strain of *B. megatherium*. A table summarizes the results of a number of such experiments and shows that on an average the factor for the number of bacteriophage particles to the number of bacilli was 0.40.

R. considers that the finding that the number of bacteriophage particles proved to be less than the number of bacilli may be due partly to an unfavourable action by the physiological saline used and partly to the difficulty in counting the exact numbers of bacilli in chains of *B. megatherium*.—M. C.

MUETHER, R. O., & MACDONALD, W. C. (1945.) Precipitin test for tuberculin antibodies.—*J. Lab. clin. Med.* 30, 411-415. 272

A quantitative precipitin test is described which uses as antigens bacteria, other than the tubercle bacillus, coated with tuberculin. A killed suspension of *Serratia marcescens*, chosen because of the uniformly small size of this bacterial species, was incubated with 1:200 dilution of Old Tuberculin at 37.5°C. for 12 hours. The bacterial suspension was previously adjusted to have the same nitrogen content as the diluted Old Tuberculin, and after incubation the coated cells were washed, suspended in saline (pH 6) and adjusted to an arbitrary standard density in a photoelectric colorimeter. To 0.5 ml. of this antigen was added 1 ml. of the serum to be tested, in dilutions ranging from 1:8 to 1:2,048; the tubes were shaken for

5 min. and read after incubation at 37.5°C. for two hours. Positive reactions were manifested by a fine granular precipitate, best read against a blue light in a darkened room. A number of precautions essential in carrying out the test are described.

Eleven g. pigs artificially infected with TB. developed serum titres ranging from 1:2 to 1:128; only one g. pig failed to develop a titre. Preliminary studies on sera from tuberculin-positive and tuberculin-negative human patients, on patients with active TB. and on patients with arrested TB. indicate that antibody titre is significantly different in active and in inactive TB. and that individuals who do not react to Old Tuberculin by skin test do not have antibodies in their serum.—A. B. PATERSON.

LENNETTE, E. H., & KOPROWSKI, H. (1944.) Neutralization tests with certain neurotropic viruses. A comparison of the sensitivity of the extraneural and intracerebral routes of inoculation for the detection of antibodies.—*J. Immunol.* 49, 375-385. 273

Antisera against the causative viruses of several types of encephalitis were prepared in rabbits. The protective value of these sera was then tested in mouse-infection experiments. The influence of the age of the mice on their susceptibility to infection by the subcutaneous and intraperitoneal routes was particularly studied. It was shown that the injection of the serum-virus mixtures by these extraneural routes was a much more sensitive way of demonstrating neutralizing antibodies than was the use of the intracerebral route. The use of mice as old as 200 days was only successful in experiments with one of the seven viruses tested. With the others the mice were most suitable when only 3-14 days old.—J. KEPPIE.

See also absts. 228 (immunity to pullorum antigen), 247 (Forssman antigen), 257, 270 (virus immunity), 259, 261 (immunity to E.E.).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SAPRE, S. N. (1944.) Some observations on the life-history of the dog tick *Rhipicephalus sanguineus* (Latreille) at Mukteswar.—*Indian J. vet. Sci.* 14, 111-112. 274

The life-history of the three-host tick *R. sanguineus* is described. The parasitic periods of the larva, nymph and adult are 4, 61 and 10 days respectively. At a temperature of 22°C. a female tick lays 2,140 eggs in 6 days and these hatch out in 31 days. The pre- and post-oviposition periods are four and six days respectively.—M. A. KHAN.

NÖRR, J. (1943.) Ein Beitrag zu den klinischen Erscheinungen bei Gastruslarvenbefall des Pferdes. [Clinical effects of bots in horses.]—*Berl. Münch. tierärztl. Wschr.* [Wien. tierärztl. Mschr. July 23rd. 241-243. 275

Chronic diarrhoea in horses may be caused by massive infestation of the stomach with *Gastrophilus intestinalis*. The infestation causes deficient closing of the pylorus, and the sudden emptying of the stomach results in the passage of undigested food material into the intestine. Diarrhoea in horses often accompanies catarrh of the stomach caused by massive infestation with *Gastrophilus* larvae. Improvement is seen and the diarrhoea may entirely disappear after removal of the larvae from the stomach by means of a suitable remedy such as carbon disulphide or carbon tetrachloride. Although gastric disturbance is to be expected with heavy infestation with *Gastrophilus* larvae, and such symptoms are described in the literature, often no impairment of appetite is noted.—T. E. GIBSON.

See also absts. 340 (*Gastrophilus*), 363 (*Phlebotomus*, *Oestrus*), 358, 360 (mange).

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

ERLICH, I. (1942.) [Parasitic worms of hares, rabbits, rats and mice.]—*Vet. Archiv.* No. 3, p. 129. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.*]

*Wien. tierärztl. Mschr.* June 11th. 188. (1943.) 276  
The results are given of an examination for parasites of 50 hares as well as of a few rabbits, rats and mice.



Lists are given in the original article of the species of parasitic worms which were found. E. discusses fully the importance of hares as carriers of fascioliasis and coenurosis of sheep. In conclusion he suggests that it is possible that the various forms of *Capillaria hepatica* occurring in different animals represent separate species.

—T. E. GIBSON.

BUGGE, G. (1943.) Zu Leuckarts Zeichnung des Muskelegels der Schweine. [On Leuckart's drawing of the muscle fluke of swine.]—*Z. Fleisch- u. Milchhyg.* 53. 141-145. 277

Observations on the muscle fluke, *Agamodistomum suis*, show that the fluke reaches the abdominal and thoracic cavities where it remains for long periods without undergoing further development. By piercing the peritoneum or pleura it migrates through the underlying fatty tissue and encysts in the underlying abdominal or thoracic muscles. The parasite wanders through connective tissue and finally becomes established in it. Leuckart's drawing of the muscle fluke does not show the host capsule which is established in conjunction with the inter- and intra-muscular connective tissue as well as that of the fatty tissue, etc. The drawings so far produced do not represent the true facts resulting from the knowledge accumulated by B. during the previous year.—T. E. GIBSON.

OLSEN, O. W. (1944.) Bionomics of the lymnaeid snail, *Stagnicola bullimoides tchella*, the intermediate host of the liver fluke in Southern Texas.—*J. agric. Res.* 69. 389-403. 278

After making a fairly comprehensive study of the habits and life-cycle of *S. bullimoides tchella*, the author concludes that the snail spends the bulk of its life on the margins of pools or in marshy places. Lateral movement is entirely passive and is mainly due to flood water. Cross-country drainage ditches constitute a likely means of dissemination. The mean infection with liver flukes in 16,276 snails dissected during one year was 0.0051%.—G. B. S. HEATH.

ADDIS, C. J., & CHANDLER, A. C. (1944.) Studies on the vitamin requirement of tapeworms.—*J. Parasit.* 30. 229-236. [See also *V. B.* 13. 360.] 279

Groups of female rats were placed on various vitamin-deficient diets and immediately infected with ten cysticercoids each of *Hymenolepis diminuta*, so that no time was allowed for vitamin deficiencies to develop in the host rats. At autopsy 14 days after infection the numbers and sizes of worms established were estimated. This experiment did not give significant results, so in two further experiments, rats were infected four and 17 days respectively after starting the deficient diets. In both these latter experiments, seven groups of six female rats were placed on diets deficient respectively in vitamin B<sub>1</sub> alone; B<sub>2</sub> complex alone; vitamins A, D and E; B<sub>1</sub> and B<sub>2</sub> complex; A, D, E and B<sub>1</sub>; A, D, E and B<sub>2</sub> complex; all vitamins; an eighth group received a complete diet. From the four days' depletion experiment the results, which were not statistically significant, suggested that lack of the B<sub>2</sub> complex inhibited the establishment and growth of the worms. The effects of deficiencies of the other vitamins were not clear-cut. Much more definite results were obtained from the 17 days' depletion experiment. Lack of the B<sub>2</sub> complex caused a marked stunting in the growth of the worms, while lack of vitamins A, D and E, or of B<sub>1</sub>, caused an increase in growth of the worms. This latter effect was considered to be due to a weakening of peristalsis in the host's intestines, allowing establishment of the worms in a more favourable anterior position. Lack of vitamins A, D and E caused a marked decrease

in the numbers of worms established and lack of the B<sub>2</sub> complex a less marked decrease.

It is concluded that the worms need to absorb the B<sub>2</sub> complex from the mucous membranes of the host, but are able to synthesize vitamins A, D and E, and possibly vitamin B<sub>1</sub>.—D. G. GILMOUR.

ERSHOV, V. S. (1941.) Printsipy i metody ozdorovleniya konevodcheskikh khozyaistv ot geogel'mintozov. [Principles and methods of freeing horse-breeding farms from helminths.]—*Trud. XV Plen. vet. Sek. Akad. sel'khoz. Nauk, Moscow, 1939.* [Diseases of Horses.] pp. 180-184. 280

E. emphasizes the adverse influence of helminth infestation on the course of equine piroplasmosis and equine infectious anaemia and recommends the carrying out in heavily affected districts of "mass dehelminthization", consisting of the co-ordination of such measures as therapeutic and prophylactic administration of anthelmintics, destruction of larvae and eggs on premises, in manure and in water, and the changing rotation of pastures. Among prophylactic measures, special attention should be paid to the hygienic construction of stables and mangers; various diagrams of these are included.

E. refers to satisfactory results obtained during 1937-38 in Kirov province after compulsory "mass-dehelminthization" of many thousands of horses. Among various anthelmintics tested, the best results were obtained with carbon tetrachloride and carbon disulphide, which were 100% effective against ascaris and strongyles and 70% effective against *Trichonema* spp. In case of ascaris infestation, E. recommends repetition of administration after 2-3 months. Saline purgatives were found to be beneficial in removing the mucus from the intestine, thus exposing the worms to the direct action of the anthelmintic. Control measures are more successful when the horses are stabled. E. recommends also that more attention be paid to *Trichostrongylus* infestation of sucking foals.—A. MOLDAWSKY.

HAWKINS, P. A., COLE, C. L., & KLINE, E. E. (1944.) Studies of sheep parasites. IV. Survival of nematodes on pasture during the fall months.—*J. Parasit.* 30. 373-376. [For part I, see *V. B.* 14. 305. Parts II & III not traced.] 281

HAWKINS, P. A., & COLE, C. L. (1945.) Studies of sheep parasites. V. Immunity to gastro-intestinal nematodes.—*Ibid.* 31. 113-118. 282

IV. Each month from September to January inclusive, some parasite-free lambs were placed for two weeks on a recently infected Michigan pasture, and were then removed to a loose box for three weeks, after which they were killed and the nematodes in their alimentary canals counted and identified. It was shown that *Haemonchus contortus* larvae had died out on the pasture in two months or less and that the numbers of *Oesophagostomum columbianum* were greatly reduced in this time and completely destroyed in three and a half months. *Chabertia ovina* larvae were also destroyed in three and a half months. After four and a half months, infective larvae of the following species were still present on the pasture: *Ostertagia circumcincta*, *Trichostrongylus colubriformis*, *Nematodirus* spp. and *Trichuris ovis*. Under the climatic conditions of Michigan, therefore, the important sheep parasites *Haemonchus contortus* and *Oesophagostomum columbianum* are perpetuated not by the pastures, but by the breeding flock.

V. Using exsheathed larvae of *Haemonchus contortus*, *Chabertia ovina*, *Cooperia curticei*, *Oesophagostomum columbianum* and *Trichostrongylus colubriformis*, the authors showed that reactions occurred when the larvae were placed in sera from three lambs and one



was infested with *H. contortus*, *T. columbriformis*, *C. vina*, *Ostertagia circumcincta* and *Trichuris ovis*. The reactions were evidenced by the formation of a precipitate on the larvae at the mouth, anus, excretory pore and/or cuticle. The percentage of larvae upon which a precipitate developed gave an indication of the degree of immunity in the animal from which the serum was taken and no precipitate was noted when larvae were placed in the sera of uninfested lambs. It is suggested

that such a reaction taking place *in vivo* in an immune sheep would immobilize the larvae which would then be attacked by phagocytes. This is suggested as a possible mechanism of immunity against nematode parasites of the gastro-intestinal tract of the sheep.

—T. E. GIBSON.

See also absts. 358 (poultry nematodes and lungworms), 361 (canine filariasis), 339-341 (anthelmintics).

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

SINGH, B., & GUPTA, D. J. (1943.) Morbid growths in the horn core of a bullock.—*Indian J. vet. Sci.* 13, 174. 283

"Horn cancer" is commonly met with in different parts of India. The condition has been variously attributed to rope galls, irritation of the cranial cavity by flies and worms and irritation due to coal-tar in treatment. In a case examined after amputation of the affected horn, the horn core was found to contain mucoid cysts of varying sizes. No zooparasites could be detected in sections.—D. A. MUNRO.

VACHSTEIN, M. (1945.) The value of the Weltmann serum coagulation reaction for the diagnosis of certain forms of malignant neoplastic disease.—*J. Lab. clin. Med.* 30, 14-19. 284

The Weltmann test depends upon the fact that when normal blood serum is diluted 1:50 with solutions

of calcium chloride,  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$ , in concentrations of 0.1, 0.09, 0.08, 0.07 in descending order to 0.01 g. per 100 ml., after boiling for 15 min., coagulation occurs in the tubes containing 0.1 g. to 0.05 g. or 0.04 g. per 100 ml., that is, in the first six or seven tubes from the left. With blood serum from diseased individuals, coagulation may occur in fewer than in the first six test tubes or in more than the first seven test tubes. When coagulation takes place in fewer than the first six test tubes an inflammatory process is indicated. Coagulation in more than the first seven test tubes occurs in processes which lead to cirrhosis of the liver, septicaemias, haemolytic anaemia, etc.

From results obtained it is suggested that the test has a differential diagnostic value in selected cases of suspected malignant disease.—JOHN G. CAMPBELL.

See also abst. 358 (odontoma, nephroma, sarcoma).

## DISEASES, GENERAL

STRAUD, Y. (1943-44.) Polyglot glossary of communicable diseases. Contribution to the International Nomenclature of Diseases.—*Bull. Hlth Org. L.O.N.* 10, 201-556. 285

The descriptive matter of the glossary is printed in both English and French. Part I (pp. 210-219) gives "description and method of use of the glossary" and table of alphabets of Cyrillic origin.

Part II (pp. 221-473) gives a list of the names of diseases in French, with their equivalent in Latin and 3 other European languages; 161 main diseases are dealt with in this section.

Part III (pp. 475-549) gives an alphabetical list of the names in all the languages covered, showing the page on which each item is to be found in Part II.

Part IV (pp. 551-556) consists of three tables showing the correspondence between the numbers of diseases given in the Detailed, Intermediate and Abridged Lists published in 1938, the approximate correspondence between the Detailed Lists for 1929 and 1938, and the correspondence between the numbers of the Detailed, Intermediate and Abridged Lists of 1929.

BITTMAR. (1943.) Über die Unterbringung der Truppenpferde an der Ostfront im Winter 1941/42. [The journey of army horses to the east front in the winter of 1941-42.]—*Z. Veterinärk.* 55, 11-20. 286

This is a survey of reports sent in by army veterinarians on duty with the German army in the East, during the severe winter of 1941-42.

Stabling of all types was used and many kinds of makeshift stables were made from locally available materials, such as logs, timber, earth, sheet metal, etc. When temperatures were below freezing point, small "horse bunkers" partly underground and holding 6-12 horses were best for obtaining an inside temperature above freezing point. Straw was an important insulating material and when used as bedding contributed much to health.

For the maintenance of health in horses, a stable temperature a little above freezing point, or a well grown hair coat and adequate food were essential. An important contributory factor was the dry cold which generally prevailed in Russia. The lack of any one of the above factors brought about exhaustion, with a tendency to fatal consequences. Horses successfully retained in health were conspicuously free from respiratory infections, which however occurred locally in wet spells in spring and autumn.

Acclimatization was of great importance and steps were taken to prepare horses in Germany for the Russian winter by hardening them to cold weather, by the avoidance of warm stables, etc., in order to produce a good hair coat.

[The title this paper suggests deals with the treatment of horses during transit to the Russian front, but actually it is about conditions at the zones of operation, with lessons drawn as to the acclimatization procedure. A clinical report on the effects of cold on horses was made by BOLZ—*V.B.* 13, 433, abst. 2914.]—J. E.

LOVELL, R. (1945.) Some of the common disorders of calves.—*Vet. Rec.* 57, 179-180. Discussion p. 181. 287

On the average, one calf in 18 born alive in Britain dies at an early age. If abortions and stillbirths are included, one pregnancy in seven fails to produce an adult animal. This heavy mortality has a markedly seasonal incidence, being considerably greater in spring than at other times of the year. L. stresses the delicate balance of the relationship between the calf and its environment and details the various factors which may upset that balance. Protection against calf diseases can be given either by immunological or hygienic methods. As far as disease is concerned, he deals specifically with white scours, *Salmonella dublin* infection, contagious pneumonia, calf diphtheria and acute lead poisoning.

In white scours, predisposing causes are almost



invariably necessary before invasion of the blood stream with *Bacterium coli* occurs. The commonest of these is over-feeding, accompanied by abnormal curd formation in the abomasum. Lack of colostrum which leads to a quantitative increase in the bacterial flora of the intestine is another common predisposing cause. Colostrum also provides calves with antibodies against miscellaneous bacteria. The newborn calf, if denied colostrum, should receive a protective meal of serum obtained from a cow in the same environment. One meal of 500-700 ml. given by mouth is probably sufficient, but this may be reinforced by the subcutaneous or intravenous injection of about 20 ml. The administration during the first 3-4 weeks of life of extra amounts of vitamins A, B complex and D is also advocated. *S. dublin* usually attacks older calves. The symptoms include blood-stained diarrhoea and pneumonia and a septicaemia may develop. Sporadic cases and outbreaks have occurred in Britain.

Contagious pneumonia may be associated with a variety of bacteria, the common lethal agents being *Corynebacterium pyogenes* and the haemolytic coccobacillus. Adverse environmental conditions are the chief predisposing cause. *Corynebact. pyogenes* antitoxin is of value.

Calf diphtheria which occurs only occasionally in Britain has been treated successfully with sulphapyridine or sulphanilamide.

Acute lead poisoning is probably more common than generally realized. Death is rapid and no treatment is possible. Other less common diseases of calves causing appreciable mortality include coccidiosis, calf tetany and parasitological conditions.—D. D. OGILVIE.

DELAFLANE, J. P. (1945.) Differential diagnosis of respiratory diseases of fowl.—*J. Amer. vet. med. Ass.* 106. 83-87. 288

The diseases dealt with in this article are laryngotracheitis, infectious coryza, infectious bronchitis, fowl pox, avian pneumo-encephalitis, chronic coryza, endemic fowl cholera, coccobacilliform coryza and infectious sinusitis of turkeys. D. gives a brief description of each condition together with the principal differential features.—J. D. BLAKLAND.

BRITTON, J. W., & CAMERON, H. S. (1945.) Experi-

mental reproduction of so-called enterotoxaemia.—*Cornell Vet.* 35. 1-8. 289

Lambs were used in experiments to compare the symptoms of acute indigestion (from gross over-feeding on wheat) with those of enterotoxaemia. The authors confirmed that the symptoms and pathological changes in the two conditions were similar. Thus, some lambs after ingesting an excessive amount of wheat for about two days suddenly collapsed, became comatose and quickly died. The findings P.M. resembled those of enterotoxaemia in that there was distension and atony of the stomachs and intestine, together with endocardial petechiae. The intestinal contents were sometimes toxic for laboratory animals.

B. reviews the literature dealing with experimental attempts to reproduce enterotoxaemia and concludes that so-called enterotoxaemia is a form of acute indigestion resulting from primary intestinal atony. [See also *V.B.* 15. 291, abst. 1770.]-J. KEPPIE.

WICKWARE, A. B. (1945.) Grasshoppers. A potential danger to turkeys.—*Canad. J. comp. Med.* 9. 80-81. 290

A condition in turkeys is described in which sudden death occurs in apparently healthy birds. Other than the findings mentioned below, no changes were present P.M.

The crop was distended and when opened was found to be filled with grasshoppers of a reddish colour, giving, at first glance, the impression of haemorrhage into this organ. The grasshoppers were identified as *Melanoplus femur-rubrum* and *M. mexicanus*. It has been reported that gallinaceous birds may be killed by eating grasshoppers, particularly where they are eaten in abundance without any appreciable amount of other food being taken at the same time. Death is caused by the hard parts of the grasshopper, particularly the heavily spined legs, not only irritating but actually puncturing the crop and intestines.

Non-gallinaceous birds are apparently not affected in any way by eating an over-abundance of grasshoppers.

—THOS. MOORE.

See also absts. 327 (dermatitis, jaundice, and arthritis), 358 (animal diseases in Brazil), 360 (in South Africa), 361 (in Fiji), 363 (in Algeria).

## NUTRITIONAL AND METABOLIC DISORDERS

— (1944.) The provision of animal fodder in tropical and subtropical countries. Part I.—*Bull. Imp. Bur. Pastures & Forage Crops, Aberystwyth.* No. 31. pp. 84. 4to. 4s. 291

This bulletin consists of a series of reports on pasture and fodder crops in certain tropical countries, namely, the West Indies, Hawaii, Fiji, the Gold Coast, Nigeria, Anglo-Egyptian Sudan, Zanzibar and Southern Rhodesia, and will be of value to all officers in the Colonial Veterinary Service.

The difficulty of obtaining supplies of viable seed from tropical grasses seems to be common to most areas and greatly increases the cost and labour involved in establishing a pasture. Of the very large number of species of grasses mentioned in this review, only *Melinis minutiflora*, *Tricholaena repens*, *Paspalum dilatatum* and *Andropogon gayanus* appear to be commonly grown from seed; *A. gayanus* is described by STEWART as the best of 50 species which have been collected around Pong-Tamale and the finding that it grows well from seed in the Gold Coast is of special interest. All the other species mentioned are propagated by stem or root cuttings. In the section on vegetation zones in

Hawaii (pp. 30-35), it is stated that "pastures may be seeded to paspalum or Kikuyu or to the larger species such as Napier grass, Guinea grass and pigeon pea". Kikuyu and Napier and Guinea grass are propagated in the other areas dealt with in the review by planting stem or root cuttings. Strains which produce viable seed may possibly have been developed in Hawaii; if so they are worthy of trial in other areas. The wide variations shown by the same species are well illustrated by *Cynodon dactylon*. In Nigeria, this is described as "a noxious weed", while in other areas it is listed among the better pasture grasses. In Hawaii it is described as the "most valuable graminaceous species". The problem of finding a satisfactory leguminous pasture plant to take the place which clovers occupy in temperate zone pastures is not yet solved and seems to be general in all the countries dealt with. *Desmodium uncinatum* is stated to have possibilities in this direction in Hawaii.

The nomenclature of tropical grasses is in need of revision. The multiplicity of local names makes it difficult for workers in one country to follow work done in other places. In this review the common grass

*Cynodon dactylon* is referred to in different sections as Bahama grass, Bermuda grass and couch grass, while in India it is known as Dhoob grass.

Sunn hemp (*Crotalaria juncea*) is used in Southern Rhodesia as a nurse crop when grass is grown from seed and may be worthy of trial elsewhere. The section on Hawaii contains some useful information on the possibilities of mechanical tillage and harvesting of fodder crops.—M. C.

SHULYUMOVA, E. S. (1940.) "Khutili" krupnovo rogatovo skota v Gruzii. (Predvaritel'noe soobshchenie.) [A nutritional disease of cattle in Georgia, U.S.S.R., known locally as "khutili". Preliminary report.]—*Veterinariya, Moscow*. No. 5. pp. 132-137. [French summary.] 292

This new bovine, non-contagious disease "khutili" is seasonal in character, being maximal during the summer and autumn, especially in hot dry years. Both sexes are susceptible, lactating cows particularly so. Affected animals lie down for prolonged periods, have normal temperatures but no appetite, become emaciated and develop paraplegia. Illness lasts 4-60 days, there is a morbidity of 3-7% and mortality is from 12-20%. Prominent lesions are hyperaemia of the liver and kidneys and to a lesser degree of the spleen. More advanced cases show degeneration of visceral organs and polyarthritis.

"Khutili" appears to be related to the pasture and/or water supply, i.e., to be nutritional in character.

—L. LEVENBOOK.

— (1945.) The amino acids in nutrition.—*J. Amer. vet. med. Ass.* 106. 229-235. 293

This article reviews present knowledge of the amino acids, the building stones of proteins.

The pioneer work of Osborne and Mendel on the indispensability of certain amino acids such as lysine and tryptophane has led up to the classic work of Rose and his colleagues, who discovered the latest of the amino acids, threonine. Of the 22 known  $\alpha$ -amino acids, ten are postulated as essential for the continued life and growth of various experimental animals, viz, arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophane and valine, growth response being employed as the criterion of essentiality. It appears that of these only eight are essential for man, arginine and histidine being excepted, although the former may play a part in normal spermatogenesis. Much of the modern work tends to proceed along the lines of determining minimal requirements and specific functions of the essential amino acids.

—A. EDEN.

McDONALD, I. W. (1942.) Enzootic ataxia of lambs in South Australia.—*Aust. vet. j.* 18. 165-172. 294

The distribution of the disease in South Australia is discussed. Although it is essentially a disease of lambs from birth to about four months of age, a case is recorded in which symptoms first appeared at the age of 4-5 years. The degenerative and sclerotic lesions of the ventro-lateral tracts and degeneration of the motor nerve cells of the ventral horns and the red nucleus are described. Gross cerebral degeneration is not common. Clinical diagnosis is usually easy and confirmation can be obtained without complete examination of the central nervous system from paraffin sections of the cord and mid-brain in the vicinity of the red nucleus. Tissues are fixed in formal-saline and the section is stained by Nissl's method and Weil's method. Sections of cord stained by Marchi's method and estimations of liver copper are also helpful. Apparent discrepancies between the findings of workers in Australia and in England are discussed.—D. A. GILL.

MUTH, O. H., & HAAG, J. R. (1945.) Disease of Oregon cattle associated with hypomagnesemia and hypocalcemia.—*N. Amer. Vet.* 26. 216-219. 295

This paper records a fatal condition amongst Hereford cattle in the Oregon coastal region during the winter months. Symptoms were typical of grass tetany and the condition was characterized by a mixed low plasma Ca and Mg status. The aetiology of the disease remains obscure.—A. EDEN.

PATTON, J. W. (1945.) Seasonal and geographic distribution of vitamin A deficiency in cattle.—*Vet. Med.* 40. 304-308. 296

Information is given concerning the seasonal and geographic occurrence of acetonemia in cattle throughout the south-eastern part of the United States. The incidence was correlated with an assumed low intake of vitamin A over a prolonged period. The disorder was found to occur in all sections of the area studied, the boundaries of which are stated. An "acetonemia belt" is defined, in which pasture and hay are most likely to be of poor quality as a result of climatic factors and in which the animals are grazed most of the year on dried-up vegetation.

P. states that acetonemia in cattle is due to a vitamin A deficiency and can be cured by administration of the vitamin and prevented by good feeding practices.

—R. ALLCROFT.

BURN, C. G., ORTEN, A. U., & SMITH, A. H. (1941.) The influence of chronic vitamin-A deficiency on the bacterial flora of rats.—*Yale J. Biol. Med.* 14. 89-99. 297

Bacteriological findings have been reported from the mucous membranes and viscera of 56 rats fed for periods of up to one year on a diet poor in vitamin A, of 95 litter-mates fed adequate amounts of vitamin A and of 10 rats suffering from total vitamin A deficiency. There was a marked increase in the number and kinds of bacteria found on the mucosal surfaces and in the viscera of both deficient groups. In older animals with a mild chronic vitamin A deficiency, the degree of bacterial invasion and tissue change compatible with a toxemia was similar to that of animals with acute deficiency of vitamin A. The vitamin A-deficient groups showed a predominance of one or two kinds of organisms, including *Staphylococcus aureus*, *Pseudomonas fluorescens* and sometimes *Brucella bronchiseptica*, while the control groups showed a large variety of organisms including a few colonies of *Streptococcus viridans*, Gram-negative cocci, occasional *Staph. aureus* or *Staph. albus*, diphtheroids and spore-forming aerobic bacilli. In the deficient animals, there was a marked decrease in the incidence and number of *Bacterium coli* on all the mucous membranes, including those of the intestines. *Str. haemolyticus* remained unaffected by the vitamin A deficiency. Suppurative lesions, especially in the sinuses and middle ear, were found in rats with acute vitamin A deficiency and in the majority of the older rats with chronic vitamin A deficiency. The organism of importance as an aetiological factor was *Staph. aureus*, while *Ps. fluorescens* and *Br. bronchiseptica* were considered to be secondary invaders. The resistance induced in the vitamin A-low and vitamin A-free rats by the administration of vitamin A is believed to be due not to specific action on the toxin or the invasive properties of the bacteria, but to non-specific stimulation related to the epithelial changes of the mucosal surfaces.—E. KODICEK.

MASON, K. E., & EMMEL, A. F. (1944.) Pigmentation of the sex glands in vitamin E deficient rats.—*Yale J. Biol. Med.* 17. 189-202. 298



From a study of the staining reactions and behaviour of tissue macrophages the authors reported that the pigment occurring in the ovaries and testes of vitamin E-deficient rats was identical with the pigment found in uterine and other smooth muscles in vitamin E deficiency. The ovarian pigment was regarded as an abnormal metabolite or intermediate breakdown product, probably of a protein-lipid combination. The amount of inorganic iron, as determined histologically, and the amount of alkaline and acid phosphatase in the ovaries of vitamin A-deficient rats were essentially of the same order as those in control animals. No melanin was detected by the dopa-oxidase reaction. A detailed histological study was made on the appearance of a pigment in macrophages of the testicular interstitial tissue. A chronic deficiency of vitamin A did not

produce any formation of pigment in the ovaries or testes of rats.—E. KODICEK.

GIROUD, A., MARTINET, M., & BELLON, M.T. (1942.) Fonction mélanotrope de l'hypophyse au cours de la carence C. [Melanotropic function of the pituitary gland in vitamin C deficiency.]-*C. R. Soc. Biol. Paris.* 136, 710-711. 299

The pituitary gland of g. pigs in a state of acute vitamin C deficiency contained twice the amount of melanotropic hormone found in the pituitary of g. pigs maintained on a diet rich in vitamin C. The authors give this as evidence that there is a pronounced modification of the pituitary function in the course of development of vitamin C deficiency.—A. EDEN.

See also absts. 263 (cobalt, phylloerythrin), 313 (milk fever, grass tetany), 279, 306, 310, 327 (vitamins).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

GRANDSTAFF, J. O., & BLUNN, C. T. (1944.) A preliminary report on the post-natal development of the fiber characteristics of the fleeces of Navajo sheep. —*J. Anim. Sci.* 8, 194-200. 300

Fleece samples collected from 15 ewe lambs at monthly intervals from birth to one year showed that during the age period 3-12 months the ratio of wool to hair to hemp stays roughly constant at 16:3:1. At birth, the ratio is in the region of 12:5:3. The authors suggest that any evaluation of the fleece to determine its genetic constitution should be carried out during the first month of the lamb's life.—G. B. S. H.

LEITCH, I., & THOMSON, J. S. (1944.) The water economy of farm animals.—*Nutr. Abstr. Rev.* 14, 197-223. 301

The authors review a large section of the literature dealing with the water economy of farm animals. Cattle are dealt with in most detail and briefer sections give some information about sheep, horses, pigs and poultry. Water requirement is determined from the amount excreted in faeces and urine, the amount of water vaporized to dissipate heat, the amount in the milk and the amount built into new tissue during growth, fattening or pregnancy. The nature of the ration determines the amount of water drunk and estimates of the requirements are given, based on dry matter of the feed. In cattle, the water content of the faeces is about 80% for steers and dry cows and 85% for milking cows. The amount of water eliminated in the urine seems to be determined primarily by the amount of roughage in the ration, but a high protein intake will increase urine volume above that determined by the roughage intake. Coat covering, the plane of nutrition and external temperature all influence the loss of water by vaporization. Water loss is reduced by shearing but a rise in the plane of nutrition increases the amount of heat to be dissipated and if temperature remains constant the vaporization increases. The effect on heat loss of changes in respiration, pulse rate and skin temperature is discussed, with special reference to tropical conditions, and high production.—T. E. G.

FOLLEY, S. J., & YOUNG, F. G. (1945.) The galactopoietic action of pituitary extracts in lactating cows. 1. Dose-response relations and total yields during declining lactation.—*J. Endocrinol.* 4, 194-204. 302

FAWNS, H. T., FOLLEY, S. J., & YOUNG, F. G. (1945.) The galactopoietic action of pituitary extracts in lactating cows. 2. The response during the peak of lactation.—*Ibid.* 205-211. 303

FOLLEY, S. J., MALPRESS, F. H., & YOUNG, F. G. (1945.) The galactopoietic action of pituitary

extracts in lactating cows. 3. Comparison of extracts of pituitary glands from different species.—*Ibid.* 212-218. 304

1. The galactopoietic action of various types of ox anterior pituitary extract administered during declining lactation was studied in experiments involving 85 cows. Data obtained on the response to single injections of crude anterior pituitary extract were combined with data from previous experiments (FOLLEY & YOUNG, 1938) and a dose-response graph was plotted, the doses of fresh pituitary tissue ranging from 0.625 to 10.0 g.-equivalents. [10 ml. contained the material extracted from 2.5 g. of fresh ox anterior pituitary tissue. This 10 ml. dose was described for convenience as 2.5 g.-equivalents of pituitary extract.]

The relation between the galactopoietic response and the dose administered was shown by a sigmoid curve. The results suggested that a dose of 2.5 g.-equivalents deserved further investigation. It was then demonstrated that this dose given at two-day intervals for three weeks brought about substantial increases in milk production. When the dose was reduced or the interval between injections increased, the response was less certain. Whole pituitary extracts gave essentially similar results and had no deleterious effect on pregnant animals although they possessed some slight oxytocic activity. Extracts of acetone-desiccated pituitary tissue were fully potent, but extracts of methanol- and ethanol-desiccated pituitary tissue were practically inactive. Further experiments showed that 2.5 g.-equivalents of anterior pituitary extract injected subcutaneously every second day over a period of three weeks raised the milk production by 20% during the period of treatment; during the following two weeks the yield was still raised by 15% above that expected. The cows were not weighed during the experiment but no loss of condition was noted.

II. During the two-month period following calving, in which the milk yield was found to remain at a steady high level, single injections of 2.5 g.-equivalents of anterior pituitary extract produced no increase in milk yield. This lack of galactopoietic response was confirmed by injecting cows at intervals of two days with 2.5 g.-equivalents of the extract for three weeks during the period of peak yield. This produced no increase in milk yield and had no significant effect on the subsequent decline in milk yield. Two cows were treated with anterior pituitary extract for five weeks before calving and for three weeks after calving; little if any galactopoietic effect was noted. Two cows which had aborted at the end of the seventh month of pregnancy were treated for three weeks commencing on the 18th day after aborting and in both cases a

significant increase in yield was produced. A total of 15 cows was used in these experiments.

It is concluded that milk production is not increased by injections of anterior pituitary extract during the peak of lactation. It is suggested that during this period the factor limiting production is not the rate of liberation of endogenous galactopoietic hormones from the pituitary, as would appear to be the case during declining lactation and probably following abortion.

III. The galactopoietic activity of ox, horse, sheep, and pig anterior pituitary extracts was tested on 24 cows in declining lactation. When single subcutaneous injections of 2.5 g.-equivalents of the pituitary extracts were given, the results showed that horse pituitary was more active in stimulating milk yield than ox pituitary. Sheep and pig pituitary extracts showed little or no activity. Injections of ox anterior pituitary extract at intervals of two days for a period of two and a half weeks produced an increase in milk yield which was significant, although not so great as that obtained in the previous experiments. Sheep and pig pituitary extract, on the other hand, produced in 7-10 days a substantial depression of the yield. Horse pituitary extract was not given in repeated doses on account of the risk of permanent ovarian damage resulting from its high follicle-stimulating activity. The possibility that the depression of the yield produced by sheep and pig pituitary extract may result from rapid antihormone formation to the heterologous glandular material is discussed. The above results cannot be correlated with the relative prolactin contents of the pituitary glands of the different species, which confirms the authors' previous contention that prolactin is by no means the only factor concerned in the galactopoietic action of anterior-pituitary extracts.—A. T. C.

FOLLEY, S. J., MALPRESS, F. H., & YOUNG, F. G. (1945.) Induction of lactation in goats and cows with synthetic oestrogens and anterior-pituitary extracts.—*J. Endocrinol.* 4. 181-193. 305

Simultaneous treatment with oestrogens and anterior pituitary extract induced lactation in virgin goats sooner than treatment with oestrogens alone. This earlier induction of lactation is believed to be due to the more rapid mammary growth induced by the mammogenic properties of the extract acting in concert with the oestrogen.

Of five animals (four cows and one goat), which failed to come into lactation with oestrogen treatment, two (a cow and a goat) came quickly into lactation when injections of anterior pituitary extract were given. It is considered probable that in some cases where there is no response to oestrogen treatment, the oestrogen has failed to cause the release of lactogenic hormones from the anterior pituitary. This deficiency can be made good by administration of the extract.

The anterior pituitary extract was found to exert a galactopoietic effect at the peak of the induced lactation, an effect not observed at the peak of normal lactation. Further evidence was obtained to support the theory that oestrogens in relatively low doses have a stimulating effect on the pituitary, whereas in high doses they are inhibitory.

Four cows, two heifers and eight goats were used in these experiments. After prolonged treatment with the extract, three of the goats became acutely ill and died; whether this was a direct action of the extract or whether the treatment increased the susceptibility of the goats to entero-toxaemia was not established.

—ALFRED T. COWIE.

SOBEL, A. E., ROCKENMACHER, M., & KRAMER, B. (1945.) Carbonate content of bone in relation to the

composition of blood and diet.—*J. biol. Chem.* 158. 475-489. 306

The paper records experiments on the effect of variation in calcium and inorganic phosphorus in the diet on the serum and bone content of calcium, phosphorus and carbonates. Newly weaned rats of 23 days of age were used and the experiments lasted for 30 days, when the rats were killed by bleeding to obtain serum for analysis. The femur was used for bone analysis after extraction by alcohol and ether. Phosphate was calculated from the calcium and carbonate present, on the assumption that the general formula of bone is  $\text{CaCO}_3 \cdot n \text{Ca}_3(\text{PO}_4)_2$ .

Group A were fed a basal ration consisting of cereals and brewer's yeast and low in both Ca and P; as it was excessively low in Ca (0.03%) it gave a wide Ca : P ratio of 1 : 11, which might have affected results. In group B,  $\text{CaCO}_3$  was added to this diet to raise the Ca content to 1.13% and in group C,  $\text{Na}_2\text{HPO}_4$  was added to the basal diet to raise the P content to 0.91%. Three further groups received the same diets with the addition of vitamin D.

The  $\text{CO}_2$  content and the  $\text{CO}_2$  : Ca ratio of bone were significantly high in group B. The  $\text{PO}_4$  : Ca ratio was higher in vitamin-fed rats. There was a direct relationship between the  $\text{CO}_2$  : P ratio of serum and the  $\text{CO}_2$  : Ca ratio of bone. The inclusion of vitamin D in the diet reduced both these ratios.—W. H. PARKER.

HUEPNER, W. C. (1944.) Reactions of the blood and organs of dogs after intravenous injections of solutions of methyl celluloses of graded molecular weights.—*Amer. J. Path.* 20. 737-771. 307

H. administered to dogs single and repeated injections of methyl celluloses of molecular weights varying from 32,200 to 143,000 and studied the changes produced in the blood picture and the organic reactions. The blood changes noted included transitory leucaemia, a decrease in the number of erythrocytes, acceleration of the erythrocyte sedimentation rate and elevation of the plasmatic viscosity, all these reactions being greater with methyl celluloses of high molecular weight than with those of low molecular weight. Methyl celluloses of high molecular weight do not cause an appreciable increase in plasmatic viscosity, even when injected in large amounts. Lengthening of the clotting time was noted only with methyl celluloses of 400 centipoises, which have approximately the same molecular weight as serum albumin. These latter methyl celluloses enter the liver cells which do not store other methyl celluloses. Lesions of a hyalinizing and calcifying character were found in the elastic and muscular layers of the arteries; they increased with the intensity and duration of the treatment and varied with the type of methyl cellulose injected, being least developed with the high molecular type.—T. E. GIBSON.

HARNE, O. G., LUTZ, J. F., ZIMMERMAN, G. I., & DAVIS, C. L. (1945.) The life duration of the red blood cell of the macaque rhesus monkey.—*J. Lab. clin. Med.* 30. 247-258. [Authors' summary copied verbatim.] 308

1. A method is given for making permanent preparations of reticulocytes in monkey blood.

2. Curves are presented showing daily reticulocyte counts in two control and eight experimental animals covering periods of from 120 to 170 days.

3. Two types of blood depletion were employed to stimulate hemopoiesis: (1) withdrawal of large amounts (1 per cent of the body weight) at one operation and (2) fractional withdrawal of .5 per cent of the body weight in blood, at intervals of 72 hours (usually four operations).



4. The span of life of the red blood cell of the macacus rhesus monkey was determined by autonomous blood replacement following haemorrhage. When this method is employed, a spontaneous reticulocyte shower occurs from 94 to 117 days later, indicating a reaction to the mass disappearance of the block of red cells originally mobilized to replace those lost by haemorrhage. The time lapse between the induction of the haemorrhage and the peak of the spontaneous reaction is interpreted to be the life span of the red blood cell in this animal. We realize that from these figures must be deducted the latent period of reaction, which in the monkey was found to be from two to four days.

ADAMESTEANU, I. (1944.) Alkalireserve im Blut und in der Zerebro-Spinalflüssigkeit beim Pferd. [Alkali reserve in the blood and cerebrospinal fluid of horses.] —*Berl. Münch. tierärztl. Wschr. (Wien. tierärztl. Mschr.* Feb. 4th. 45-56. 309

Figures are given for the alkali reserve in the blood and cerebrospinal fluid of 30 horses. Normal geldings and mares 3-12 years old [breed not stated] were used and with one exception the nutritional state was good. The cerebrospinal fluid was collected under liquid paraffin from a suboccipital puncture; no details are given of the method of collecting blood or the method of estimation. For 20 pairs of values of alkali reserve in blood and cerebrospinal fluid a correction was made for  $\text{CO}_2$ ; for two animals values are given both with and without such correction.

All the uncorrected values for blood were higher than those for cerebrospinal fluid. Of the corrected values for blood, 17 were higher, four the same and one lower than those for cerebrospinal fluid, the last values being from the animal in poor condition. The differences tended to be greater after correction.

References and figures are given for the alkali reserve in the cerebrospinal fluid in man and there is a short discussion of their variation in cerebromeningitis. —A. CARLYLE.

DRILL, V. A., & GUNN, F. D. (1944.) Hepatic lesions and experimental hyperthyroidism. —*Endocrinology*. 35. 477-482. 310

Adult white rats fed on thyroid gland for periods of 17-78 days failed to show any significant changes in liver structure although they lost 13-178 g. in body weight. The loss of body weight during thyroid treatment could be prevented by supplementing the diet with vitamin B complex concentrates, thus allowing the treatment to be continued for a relatively longer period. The liver histology, however, remained normal. It is believed that the hepatic damage reported in earlier observations on experimental hyperthyroidism may have been due to unbalanced diets. —ALFRED T. COWIE.

KLIMOV, N. M. (1940.) Evakuatsiya i perevarivanie korma v tolstom otdelke kishchechnika u loshadi. [Digestion in the large intestine of the horse.] —*Veterinariya, Moscow*. No. 5. pp. 109-116. [French summary.] 311

By means of a caecal fistula in each of two foals, K. investigated the time of passage of food through the alimentary system and its digestion in the caecum.

He concluded that food enters the caecum on an average two-and-a-half hours after the commencement of feeding, irrespective of such factors as exercise, and remains there 30-47 hours. Food passes through the large intestine, excluding the caecum, in 24-27 hours and through the whole alimentary tract in 60-74 hours. The period required for the evacuation of the gastrointestinal tract depends on the time, quantity and quality of the ingested meal and is hastened by exercise.

Individual small meals fed in succession at short

intervals do not coalesce, but retain their identity throughout their passage through the gut. Exercise affects the amylolytic and proteolytic processes in the caecum, so that carbohydrates are absorbed more rapidly, but proteins more slowly. —L. LEVENBOOK.

TROITSKI, I. A. (1940.) Sostav zheludochnoy soka loshadi na pustol zheludok i posle gistaminizatsii. [The gastric juice of foals before and after treatment by histamine.] —*Veterinariya, Moscow*. No. 6. pp. 101-108. [French summary.] 312

Pure gastric juice was obtained from each of three foals with an experimental gastric fistula and from a fourth with a gastric vesicle isolated by Heidenhain's technique. Analysis gave the following average figures: —specific weight: 1.0058, viscosity: 1.07, pH: 1.34, total acidity: 56.6 [? expressed as the titre value of deci-normal NaOH per 100 ml. of gastric juice or 0.2% of HCl], free HCl titre: 45.3 or 0.15%, pepsin: 2%, rennin: 1:250, lipase: nil, proteolytic activity as compared with man: slight, volume per 24 hours (on a fasting stomach): 3,141-5,544 ml.

The injection of histamine in doses from 0.01-0.04 g., depending on the weight of the foal, increased the secretion of gastric juice in the first half hour 3-9 times. In two hours, secretion had dropped to normal. The total acidity and the free HCl were also increased.

This method of increasing the flow of gastric juice is not generally recommended, except as a test of the secretory activity of the gastric mucosa. —L. LEVENBOOK.

CALDWELL, M. J., & HUGHES, J. S. (1945.) A suggested explanation for the action of mineral elements on nerve irritability. —*J. Amer. vet. med. Ass.* 106. 298-300. 313

A theory is advanced to explain the action of various mineral elements upon nervous irritability. The nerve, with its high content of lipoids, is regarded as an emulsion-like organization of lipoidal and non-lipoidal material which responds to the action of monovalent and divalent elements in a similar manner to oil and water emulsions *in vitro*. The four principal elements involved in controlling nervous irritability are monovalent Na and K and divalent Ca and Mg. Conditions such as milk fever and grass tetany in animals, responding to Ca and Mg therapy respectively, and familial periodic paralysis in man, responding to ingestion of K, are cited as supporting the view that the associated nervous irritability is due to imbalance of these elements in the nervous tissue. The authors suggest that further investigations be carried out to ascertain the variations in the amounts of these elements in nervous tissue in relation to changes in irritability, and the part played by these elements in the control of irritability. —A. EDEN.

HAMMOND, J., Jr. (1945.) Induced ovulation and heat in anoestrous sheep. —*J. Endocrinol.* 4. 169-180. 314

The effect of single injections of pregnant mare serum gonadotropin either alone or along with an injection of free stilboestrol or its di-n-butyrate was studied in experiments involving 90 sheep. The time of onset of oestrus was noted and the reproductive organs were examined at autopsy 4-6 days after the injections. None of the sheep injected with P.M.S. alone came into oestrus, although it was found that all had ovulated. Stilboestrol inhibited the induction of ovulation by P.M.S. if given before or too soon after the gonadotropin. Stilboestrol alone induced ovulation in a proportion of cases. When stilboestrol was given alone or in conjunction with P.M.S., oestrus was more frequent in those sheep which had not ovulated. In cases where both oestrus and ovulation occurred, the time relationship appeared to be unfavourable for fertilization, for although the ewes were run continuously with the ram,

only two fertilized ova were recovered. The mechanisms involved in the stimulation of ovulation and oestrus are discussed. It is concluded that there seems little prospect of obtaining a treatment for induced fertility in anoestrous sheep based on the use of P.M.S. and stilboestrol.—ALFRED T. COWIE.

CALISTI, V. (1943.) Il corpo luteo in rapporto alla gravidanza nelle pecore. [Effect of the corpus luteum on pregnancy in sheep.]—*Nuova Vet.* 21. 63-70. 315

C. showed that in sheep neither unilateral nor bilateral ovariectomy, when carried out during the second half of pregnancy, had any effect on the normal course of gestation. Sheep ovariectomized during this period completed their gestation normally, undisturbed by the operative trauma, and gave birth to fully developed, active lambs. Their mammary glands developed fully. It seems that after about the 80th day of pregnancy the corpus luteum is not essential for the normal development of gestation and C. believes that its function may be taken over by the placental hormone.

—ISOBEL W. BROCKLEHURST.

WHITTEN, W. K. (1943.) Some observations on the excretion of keto-steroids and oestrogens in the urine of sheep.—*Aust. J. exp. Biol. med. Sci.* 21. 187-190. 316

The urine of two ewes, subsequently found to have borne ram lambs, was examined at intervals during pregnancy for 17-keto-steroids and oestrogens. The former were present throughout pregnancy. Oestrogens were detected only in the last month of pregnancy, when over 200 I.U. per day were excreted by one ewe and over 133 I.U. per day by the other. The quantity excreted was estimated from bio-assays based on vaginal smears from castrated female rats. This appears to be the first record of oestrogens in sheep urine.—D. A. GILL.

\*GALLINA, L. (1942.) Importanza della gravidanza e della relativa diagnosi nella bovina. [Pregnancy diagnosis in cattle.]—*Clin. vet., Milano.* 65. 339-345. [Abst. from abst. in *Jber. Vet.-Med.* 71. 109.] 317

This is a general discussion on pregnancy diagnosis, emphasizing its importance in breeding practice. G. points out that further work is required on many aspects of the subject, in particular on the psychological factors influencing sexual desire in the bull.—T. E. G.

OWEN, R. D., STORMONT, C. J., & IRWIN, M. R. (1944.) Differences in frequency of cellular antigens in two breeds of dairy cattle.—*J. Anim. Sci.* 3. 315-318.

The antigens of the red blood cells from large numbers of both Guernsey and Friesian cattle were typed, with a view to establishing a genetic difference between the two breeds. Samples representative of a cross section of the two breeds in the U.S.A. were examined for their content of 30 different antigens. Each of the antigens appeared in at least some representatives of the two breeds but despite this qualitative similarity, the quantitative analysis revealed significant differences, sufficient to prove that the two breeds were distinct populations. From the data the authors postulate that the genetic difference will be shown to rest primarily on a difference in the frequency of occurrence of genes which are common to both breeds.

—J. KEEPIE.

DOUGHERTY, T. F., & WHITE, A. (1944.) Influence of hormones on lymphoid tissue structure and function. The role of the pituitary adrenotropic hormone in the regulation of the lymphocytes and other cellular elements of the blood.—*Endocrinology.* 35. 1-14. 319

Single injections of 1 mg. purified adrenotropic hormone into mice, rats and rabbits produced an absolute lymphopenia and an increase in polymorphonuclear leucocytes. While the polymorphonuclear response was not specific, the lymphopenia seemed to be due to a specific response to the hormone. It did not occur in adrenalectomized animals treated with adrenotropic hormone, or in intact animals treated with pure protein.

Aqueous adrenal cortical extract, cortical steroids in oil, corticosterone, or the adrenal cortical steroid called compound F (Wintersteiner) produced marked lymphopenia in adrenalectomized mice. On the other hand, desoxycorticosterone did not decrease the total number of blood lymphocytes in either normal or adrenalectomized animals. It was concluded that the pituitary adrenotropic hormone is a factor on the regulation of the number of blood lymphocytes and may be also concerned with the regulation of certain bone marrow elements. Its effect is mediated by the adrenal cortex.—E. KODICEK.

SWINGLE, W. W., & REMINGTON, J. W. (1944.) The rôle of the adrenal cortex in physiological processes.—*Physiol. Rev.* 24. 89-127. 320

This is a review of certain aspects of the physiology of the adrenal cortex. The subject is discussed under the following headings: factors affecting the life span after adrenalectomy; relation to electrolyte metabolism; relation to renal function; relation to water diuresis and diabetes insipidus; influence on organic metabolism; resistance to drugs, infections, injuries, etc.; blood vascular system in adrenal insufficiency; relation to lactation. The bibliography contains 531 references.—ALFRED T. COWIE.

BRUSH, H. V. (1945.) The effects of thyroxin and stilboestrol on healing of fractures in the rat.—*Amer. J. Anat.* 76. 339-373. 321

The normal process of repair in experimental fractures of the fibula was studied in rats. This process of repair was slightly but only temporarily retarded when the rats were given intramuscularly 1.0 mg. thyroxin or stilboestrol per week. The character of the repair process was not altered and the retardation effect was considered to be non-specific.

Simultaneous studies were made on the effect of the hormones on the tibial epiphyses and costochondral junctions. These effects were specific and marked. Stilboestrol inhibited proliferation and resorption of cartilage and bone; thyroxin accelerated proliferation, differentiation and resorption of cartilage and bone. These results are described and discussed in detail. B. believes that there are fundamental distinctions between bone growth and bone repair and that these processes respond independently to certain experimental procedures. Over 200 rats were used in these experiments.

—ALFRED T. COWIE.

MANDL, F. (1944.) Adult tissue extracts in promotion of wound healing.—*J. internat. Coll. Surg.* 7. 34-43. 322

Extracts of adult sheep or chicken heart made with Tyrode's solution accelerate the healing of wounds. The extract was applied on gauze which was changed either every day or every other day. The active material could be precipitated with alcohol and dried *in vacuo*. The dried material was effective when dusted on to wounds. The dry powder could be applied as a mixture with sulphonamide.—E. BOYLAND.

SHNELL, K. N. (1944.) Sokrashchennaya terminologiya nog loshadi. [Abbreviated terminology for the description of the horse's legs.]—*Veterinariya, Moscow.* No. 2-3. p. 37. 323



In the proposed terminology, the right and left leg are indicated by the initial letters R and L and the fore and hind leg are written as the nominator and denominator of a vulgar fraction. Thus, L/O is left fore leg, L/L left fore and hind legs, 2/O two fore legs. Phalanges are designated by Roman figures placed in front of the fracture. "Fracture III-R/O" means fracture of the third phalanx of right fore leg.

This replacement of long words by symbols is regarded as being of great help to veterinary surgeons, veterinary clinics, stud farms, race courses, etc., as well as saving labour and paper.—E. CHERKESI.

FREI, W. (1944.) Die Pathogenität der Bakterien als biochemisches Problem. [The pathogenicity of bacteria as a biochemical problem.]—*Schweiz. Arch. Tierheilk.* 86, 171-187. 324

F. discusses the importance to pathology of the study of the chemical effects of bacterial activity on tissue cells and the views of various workers concerning the development of enzymes from bacterial cells. Lactase can be formed by "coli" bacilli in a medium

containing lactose, and if a single cell in a "coli" culture contained lactase there would be rapid multiplication of this in a lactose-containing medium. The growth of bacteria is not even always necessary to the formation of enzymes. It was found that growing, resting and non-proliferating bacterial suspensions in a given substrate formed hydrogen-lyase, which separates hydrogen from certain substances, and in yeast galactozymase which splits off galactose.

The conditions necessary for the growth of bacteria in tissue cells are given and mention is made of the building, e.g., by tubercle bacilli, of complex protein material from an inorganic salt and a few simple organic compounds. The factors which produce pathological lesions are listed. The formation and characteristics of exotoxins and endotoxins are described. The bacterial enzymes which bring about the degradation of proteins are discussed as are those which destroy carbohydrates.—N. CORCORAN.

See also abstr. 363 (blood picture of camels).

## POISONS AND POISONING

HANSMANN, G. H., & PERRY, M. C. (1940.) Lead absorption and intoxication in man unassociated with occupations or industrial hazards. Absorption of lead from eleven weeks of intrauterine life to ninety-three years of age.—*Arch. Path.* 30, 226-239. 325

Analyses of tissues from 48 human bodies, the ages of which ranged from 11 weeks' gestation to 93 years, showed that the amount of lead in rib bone varied from nil to 21.03 mg. per 100 g. dry tissue. The analyses of eight entire foetuses ranging in age from 11-24 weeks' gestation showed the presence of Pb in 62% of them, thus confirming that Pb is able to pass through the placenta. Of 11 foetuses from 4½ months to term, 80% had Pb in the rib bone or liver or in both tissues. The highest value for rib bone (23.06 mg. per 100 g.) was obtained in a foetus of six months, the mother of which excreted Pb in increasing amounts in the urine during a subsequent pregnancy.

Tabulated data compiled from a review of the literature are presented, giving the Pb content of various tissues.

It is suggested that Pb absorption may be an unrecognized factor in various diseases in persons who cannot trace exposure to lead.—R. ALLCROFT.

RIGGS, H. E., LETONOFF, T. V., & REINHOLD, J. G. (1944.) Tissue lead concentrations in disease.—*Amer. J. clin. Path.* 14, 175-186. 326

Since Hansmann and Perry [see preceding abstr.] suggested that absorption of Pb may be an unrecognized factor in various diseases in persons not known to have been exposed to lead, it was thought desirable to estimate the Pb content of the tissues of patients who died from unrecognizable disorders. Pb was estimated in the kidneys and pituitaries of 135 patients and higher concentrations were found in 95 patients whose death was not adequately explained by clinical and P.M. observations, than in the tissues from a group of 40 patients with clearly defined causes of death. Values of  $0.79 \pm 0.28$  mg. Pb per 100 g. for kidney and  $1.63 \pm 0.75$  mg. Pb per 100 g. for pituitary were taken as representing concentrations of Pb which were associated with no evidence of toxicity; concentrations exceeding these values by more than three times their standard deviation, i.e., kidney  $>1.63$  mg. and pituitary  $>3.88$  mg. per 100 g., was considered evidence of significantly increased Pb absorption.

Certain manifestations, viz, disorders of the nervous system, fatty liver, repeated vomiting, peripheral vascular collapse, or elevated blood pressure, for which no organic basis could be determined at necropsy, appeared to be common to the group showing high Pb concentrations, although these patients were suffering from many clinically dissimilar conditions. It is pointed out that similar findings are often associated with Pb intoxication.—R. ALLCROFT.

— (1945.) Toxicity of thiouracil.—*Lancet.* 248, 824. 327

Treatment with thiourea, thiouracil or related compounds may cause agranulocytosis, drug fever, dermatitis, jaundice, oedema of the feet, arthritis, lymphadenopathy, splenomegaly, cardiac arrhythmia and enlargement of the thyroid gland. Toxic reactions have been observed in 10-15% of patients treated with these drugs. Experimental work has shown that though the normal rat thyroid does not become malignant when treated with a carcinogen (acetylaminofluorene), the combined action of carcinogen and allylthiourea induces malignant tumours of the thyroid. Smaller doses of the drug and treatment with proteolyzed liver or vitamin B to reduce the incidence of agranulocytosis should give better results. The factor responsible for the granulocytopenic effect of liver preparations may be pyridoxine.—E. BOYLAND.

CAMERON, G. R. (1945.) The toxicity of 2,2-bis(p-chlorophenyl) 1,1,1-trichloroethane (D.D.T.)—*Brit. med. J.* June 23rd, 865-871. 328

C. investigated the toxicology of D.D.T. to rats, g. pigs and rabbits. The substance was used in solution or as emulsions in various solvents. It was administered by different routes, in single and repeated doses. Experiments were also made on the effects on human beings of wearing garments impregnated with D.D.T. The L.D.50 for rats and rabbits given D.D.T. in 1-5% solution in olive oil "by stomach" has been assessed as 150 and 300 mg. per kg. body weight respectively. From the results of many animal tests it was concluded that there is a wide margin of safety in regard to its toxic properties when dilute solutions suitable for insecticidal purposes are employed. When concentrates of D.D.T. in oily solvents were employed there was some danger of poisoning, but less when it was used as a dry powder.

Nervous symptoms and severe damage to the liver were characteristic of D.D.T. poisoning. Premonitory symptoms of poisoning were anorexia, muscular weakness and fine tremors.—H. PAVER.

MOSES, C. (1945.) Photosensitivity as a cause of falsely positive cephalin-cholesterol flocculation tests.—*J. Lab. clin. Med.* 30. 267-269. [Authors' conclusions copied *verbatim*.] 329

## PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

HEATLEY, N. G. (1945.) Administration of penicillin by mouth.—*Lancet.* 248. 590-591. 330

H. reports four cases given 3 g. sodium bicarbonate in 150 ml. of milk, followed 10 min. later by 15,000 units of penicillin in 100 ml. of water containing a beaten-up egg. For comparison, the patients were given on other days, the same dose in 100 ml. of water and the same dose by intramuscular injection.

Following the dose with egg, the maximum concentration in the urine was reached after two hours, although none could be detected in the blood at this stage. The dose given in water alone was absorbed and excreted more rapidly than that with egg and the serum and urine levels were much lower.

In an endeavour to obtain a bacteriostatic level in the blood, one patient was given 100,000 units with egg as before. After one hour a peak of 0.46 units per ml. was reached, which fell to 0.06 units per ml. after three hours and penicillin was undetectable at six hours. During this time only 16% of the initial dose was excreted in the urine.—R. M. LOOSMORE.

HIMMELWEIT, F. (1945.) Combined action of penicillin and bacteriophage on staphylococci.—*Lancet.* 249. 104-105. 331

Penicillin does not inhibit the multiplication or the lethal and lytic activities of staphylococcal bacteriophage K. The bacteriophage and penicillin have a synergistic action on the staphylococcus S3K, so that when the two agents are used together, rapid sterilization occurs. By using bacteriophage in penicillin assays, the sensitivity can be increased, so that concentrations of 0.001 unit per ml. may be detected.—E. BOYLAND.

GAVRONSKY, J. O. (1945.) Penicillin grown from a nutrient medium prepared from potato extract.—*Brit. med. J.* July 21st. 82-83. 332

Potatoes or potato peelings are hydrolyzed with 2% hydrochloric acid for three hours at a pressure of three atmospheres and 135°C. The hydrolysate is filtered through linen, diluted to contain 4% glucose and neutralized. "Corn steep liquor" and sodium nitrate are added, the pH is adjusted to 6 and the medium sterilized. When this medium is used for cultivating the penicillium, a crude penicillin solution containing an average of 30 units per ml. is obtained.—E. BOYLAND.

SMITH, W., & SMITH, M. M. (1945.) Production of sterile and stable penicillinase.—*Lancet.* 248. 809-810. 333

Dry stable preparations of penicillinase can be obtained by extracting vacuum-dried cultures of the paracolon bacillus, with 100 volumes of dilute sodium hydroxide, to give a pH of 9.5. The extract is filtered through a gradocol membrane of average pore diameter 0.76 $\mu$  and is dried in glass phials over phosphorus pentoxide. This dried material can be rapidly reconstituted by adding water immediately before it is required for use.—E. BOYLAND.

DOLPHIN, A., & CRICKSHANK, R. (1945.) Penicillin therapy in acute bacterial endocarditis.—*Brit. med. J.* June 30th, 897-901. 334

The photosensitivity of the cephalin-cholesterol flocculation reaction has been confirmed. Since this reaction occurs in artificial light as well as in sunlight, it is not due to any property peculiar to the latter. It is not due to heat generated in the sample by light. It is suggested that it may be worth while to study the photosensitivity of this reaction in patients with hepatic disease, and a simple method of doing this is given.

See also absts. 287 (lead poisoning in calves), 344 (snake bite).

Six cases of acute bacterial endocarditis were treated with penicillin. Blood cultures yielded group B haemolytic streptococci from three cases, group A streptococci from one and *Staphylococcus aureus* from two. The penicillin was administered in moderate dosage (100,000-200,000 units daily) by different routes for 10-15 days. Four cases were alive six months after treatment ceased, but one died from heart failure. The other three cases recovered.—R. M. LOOSMORE.

SCHWEINBURG, F. B., & YETWIN, I. J. (1945.) Sulfamethazine: in vitro action on enteric pathogens as compared with sulfadiazine and sulfamerazine.—*J. Bact.* 49. 193-197. [Authors' summary copied *verbatim*.] 335

Sulfamethazine *in vitro* is by far a more effective bactericidal and bacteriostatic agent than the other sulfonamides examined against *Eberthella typhosa*, *Escherichia coli*, and the *Salmonella* varieties. A similar conclusion may be drawn in its use against *Shigella sonnei* and the Hiss dysentery strain. The drug is effective in the test tube on the typhoid-colon group in concentrations which would suggest that clinical application should be attempted, especially since all other sulfonamides offer no convincing evidence of their ability to combat cases of typhoid fever or of its chronic carrier state (Long, 1941, Cutting and Robson, 1942; Kirby and Rantz, 1942) and of the *Salmonella* infections (Bornstein and Strauss, 1941; Bornstein, 1943).

AUGUSTINE, D. L., WEINMAN, D., & McALLISTER, J. (1944.) Rapid and sterilizing effect of penicillin sodium in experimental relapsing fever infections and its ineffectiveness in the treatment of trypanosomiasis (*Trypanosoma lewisi*) and toxoplasmosis.—*Science.* 99. 19-20. 336

Penicillin sodium therapy was completely ineffective in treatment of *T. lewisi* infection in rats and of toxoplasmosis in mice. Treatment of mice infected with relapsing fever (*Spirochaeta novyi* infection) with a first dose of 1,000 units of penicillin and then with 500 units every three hours for 48 hours (total, 9,000 units) was remarkably effective.—E. BOYLAND.

RIPSOM, C. A., & HERRICK, C. A. (1945.) Effects of various sulfa compounds on the protozoan parasite, *Eimeria tenella*.—*J. Parasit.* 31. 98-108. 337

Sulphadiazine was used for most of the work described, as it was more readily available than sulphamethazine. When sulphadiazine was fed to chickens as 1% of the ration at the time of infection it reduced the severity of the infection. The severity of the infection was also greatly reduced when the drug was given during the third day of infection; oocyst production was prevented when the drug was administered during the fifth and sixth days of infection but this did not influence the development of immunity. Sulphadiazine was markedly toxic at levels of 2-3% in the feed. The drug remained at a protective level in the chicken for only one day when given as a single large dose. The viability of the oocysts already formed in the tissue was not affected. Sulphathiazole prevented



infections when given before or at the time of infection.

—C. HORTON SMITH.

MARSHALL, P. B. (1945.) The absorption of sulphonamides in the chick and the canary, and its relationship to antimalarial activity.—*J. Pharmacol.* 84. 1-11. 338

Sulphanilamide and its derivatives, which are active against *Plasmodium gallinaceum* infections in chickens, show little or no activity against *P. cathemerium* infections in canaries. Thorough investigation was therefore undertaken to determine the rates of absorption and the blood concentrations attained in chickens and in canaries receiving these drugs. In the chicken, sulphadiazine and sulphamethazine are the most active antimalarials and they also produce the highest blood concentrations, which are maintained at a fairly high level for 16 hours after administration. Sulphanilamide and sulphathiazole are half as effective and the blood concentration curves are correspondingly lower. The sulphanilamido-benzamides and N-(6'-quinoxalyl)-sulphanilamide show about one-fifth of the activity of sulphadiazine. The blood concentrations are low and, except for 2-sulphanilamido-benzamide, fall to zero within 16 hours. The sulphanilamido-quinoline compounds give very low blood concentration curves and there is only a trace of antimalarial activity. Sulphapyridine, although producing an initial high blood concentration, falls to a low value within seven hours. In canaries, it was shown that very much higher blood concentrations of sulphadiazine must be maintained to inhibit *P. cathemerium* than are necessary to inhibit *P. gallinaceum* in chicks. The drugs are absorbed more quickly and are excreted more quickly from the blood in canaries than in chicks.—C. HORTON SMITH.

DESCHIEUS, R. (1944.) Les propriétés parasitocides des dérivés triphénylméthaniques dans les helminthiases des animaux domestiques. [Parasitocidal properties of triphenylmethane derivatives in helminthiases of domestic animals.]-*Bull. Acad. vét. Fr.* 17. 111-116. 339

D. has studied the anthelmintic properties of a number of derivatives of triphenylmethane, viz, basic and acid fuchsin, crystal violet, gentian violet, methyl green, malachite green (sulphate and hydrochlorides), and brilliant green. The anthelmintic potency of these derivatives appears to be related directly to the number of amino groups in the molecule. The derivatives are relatively non-toxic to mammals but are highly toxic to certain helminths. The compounds were tested *in vitro* at a dilution of 1:3,000 against the free-living nematode, *Rhabditis macrocerca*, and against the larvae of *Haemonchus contortus*. *In vivo* tests were performed on the oxyurids of mice, *Syphacia obvelata* and *Aspiculuris tetraptera*, each 20 g. mouse receiving 0.75 ml. of a 1:2,000 aqueous solution of the drug under test for 8-10 consecutive days. Observations were also carried out on the effects of the drug on *Hymenolepis nana* var. *fraterna* in the experimental mice.

The following nematodes have been found to be susceptible to the action of triphenylmethane derivatives: *Enterobius intestinalis*, *Syphacia obvelata*, *Aspiculuris tetraptera*, *Passalurus ambiguus*, *Toxocara canis*, and human *Ascaris lumbricoides*. Cestodes acted upon were *Hymenolepis nana*, *H. diminuta*, and *Dipylidium caninum*. Larvae susceptible to the action of the drugs were those of *Haemonchus*, *Bunostomum*, *Dictyocaulus*, *Protostrongylus*, *Angiostrongylus*, *Necator*, and *Strongyloides*.

Further investigations were carried out on helminths in the rabbit and other domestic animals using basic fuchsin, malachite green and gentian violet. At a dosage level of 0.02-0.04 g. per kg. per day for 10

days, basic fuchsin proved effective against ascariasis in the dog and at 0.03 g. per kg. against *Dipylidium caninum*. Prolonged treatment of a ewe with basic fuchsin at the rate of 0.04-0.06 g. per kg. per day failed to eliminate *Haemonchus* and *Bunostomum*, but a decrease in egg count and a clinical improvement followed. Clinical improvement was noted in a case of ancylostomiasis in a dog with a dose of 0.03 g. per kg., but all the worms were not eliminated. The drug was inactive against the anoplocephalid tapeworms, *Moniezia* of the sheep and *Andrya rhopalcephala* of the rabbit.

Malachite green was effective against oxyurids of the rabbit, but was less active against *Hymenolepis* of mice than was basic fuchsin. Tests were not made with this substance on parasites of the domestic animals.

Gentian violet is active against oxyurids in the rabbit and is reported in the literature to be effective against oxyurids in man.—T. E. GIBSON.

\*GANSLMAYER, R., & TUNKL, B. (1941.) [Anthelmintic action of tetrachlorethylene in horses.]-*Vet. Archiv.* No. 4. p. 149. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* June 25th. 206. (1943).] 340

Tetrachlorethylene in a dose of 0.1 ml. per kg. body weight mixed with liquid paraffin (1:4) was administered by stomach tube or in a gelatin capsule to 971 horses affected with worms. No toxic symptoms were observed and the treatment proved effective against ascarids and *Gastrophilus* spp.—T. E. GIBSON.

\*FRANCK, R. (1942.) Untersuchungen über die Veränderungen des Artenverhältnisses der Pferdestrongyliden I. nach Behandlung mit Cholivetrat, II. nach Behandlung mit Cuprosolvin. [Changes in the species proportions of horse strongyles. I. After treatment with "Cholivetrat". II. After treatment with "Cuprosolvin".]-*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 277.] 341

"Cholivetrat" [a copper-arsenic-aniline compound] acted principally against *Strongylus vulgaris* and less actively against *Trichonema* spp., *S. equinus* and *S. edentatus*. Fall in egg count was not observed until 26-32 days after the last treatment had been given and the count increased to its former level in six weeks' time. "Cuprosolvin" was active chiefly against the large strongyles, being less efficient against *Trichonema* spp. Fall of egg count was not observed until 15-17 days after the last treatment and a rise was observed a few days later, showing that complete elimination of the strongyles had not been achieved. Both drugs possess an excellent tonic action.—T. E. G.

CULP, O. S., MAGID, M. A., & KAPLAN, I. W. (1944.) Podophyllin treatment of condylomata acuminata.—*J. Urol.* 51. 655-659. 342

The authors describe the successful treatment with podophyllin of soft warts of the genital organs (condylomata acuminata) in man. One hundred cases were treated and most of them were cured within two or three days. The podophyllin is applied as a 25% suspension in liquid paraffin or as a paste of the powdered drug and water. [The possible application of this treatment to venereal granuloma of the dog suggests itself.]-M. C.

MACGREGOR, J. V. (1945.) Treatment of soft warts with podophyllin.—*Brit. med. J.* April 28th. 593-594. 343

In confirmation of the results reported in the preceding abstract, M. found that a preparation containing 25% podophyllin resin B.P. in liquid paraffin B.P. was highly effective in dealing with 25 cases of single or multiple condylomata acuminata of the penis or anus.

In addition, a severe case of profuse eruption of warts of the face, mainly in the beard area, of 18 months' standing, hitherto unsuccessfully treated by chemical caustics, curetting and small doses of X-rays, was successfully cleared up with 15 applications over a period of four weeks.

Stress is laid on the need for thorough and if necessary prolonged application. Podophyllin does not appear to injure the urethral mucosa.—A. N. WORDEN.

FETHERS, G. (1943.) Tiger snake (*Notechis scutatus*) bite in a dog successfully treated with antivenene.—*Aust. vet. J.* 19. 45-46. 344

The diagnosis on admission to hospital was based only upon clinical signs (incomplete posterior paralysis, some muscular rigidity throughout the body, accelerated respiration, retention of faeces and urine, and some red cells in urine removed by catheterization. Puncture wounds could not be found and no one saw the dog bitten. Since the property from which the dog came was known to be "snake-infested", 3,000 units of tiger-snake antivenin were administered intravenously with subsequent injections of 1,500 and 3,000 units. The dog recovered slowly during the subsequent 12 days. [In spite of the recovery, it seems unjustified to claim on such evidence that the illness in the dog was snake-bite and to incriminate the species of snake.]

—A. W. TURNER.

VAZ, Z., PEREIRA, R. S., & MALHEIRO, D. M. (1945.) Calcium in prevention and treatment of experimental DDT poisoning.—*Science*. 101. 434-436. 345

The authors quote the work of MINOT (1927) establishing the effectiveness of intravenous injection of Ca in the treatment of carbon tetrachloride poisoning in dogs. The symptoms of D.D.T. poisoning are those of tetanic spasms. The authors produced poisoning in nine dogs of varied breeding by daily doses of D.D.T. at the rate of 100 mg. per kg. liv weight. Calcium borogluconate in doses of 20-30 ml. of a 10% solution was used both as a preventive and as treatment in dogs intoxicated with doses of D.D.T. up to double that mentioned. Excellent results are claimed, but no mention is made of the use of control animals. The authors draw the conclusion that the symptoms of D.D.T. poisoning are due to a lowering of the serum Ca level.—W. H. PARKER.

GOLDSCHLAG, F. (1942.) Experiments on the improvement of the treatment of mustard gas lesions of the skin.—*Med. J. Aust.* May 30th. 620-622. 346

An ointment containing 2% chloramine-T (sodium salt of *p*-toluene N-chlorosulphonamide) in lanolin and vaseline is usually effective if applied immediately, but may be irritating. This may be overcome by lowering the chloramine-T to 0.2% and combining it with 8% of

"kerosol O.T. dry 100%" (dioctyl ester of sodium sulphosuccinate).—A. W. TURNER.

McINTOSH, J., ROBINSON, R. H. M., SELBIE, F. R., REIDY, J. P., BLAKE, H. E., & GUTTMANN, L. (1945.) Acridine-sulphonamide compounds as wound antiseptics. Clinical trials of flavazole.—*Lancet*. 249. 97-99. 347

Flavazole, a compound of proflavine and sulphathiazole, dissolves in water to give slightly alkaline solutions. Flavazole is less toxic and less irritant than proflavine, but has the bacteriostatic activity of its components against Gram-positive organisms and increased activity against Gram-negative bacilli. It can be used for wound sterilization either as a solution or as a powder diluted with 50 parts of sulphathiazole. This mixture can be mixed with penicillin to give a very potent antibacterial powder.—E. BOYLAND.

WYSS, O., & STRANDSKOV, F. B. (1945.) The germicidal action of iodine.—*Arch. Biochem.* 6. 261-268. 348

The sporicidal action of iodine is due to the iodine itself and to hypiodate (particularly in alkaline solution). The action is complex and varies with the temperature and pH. The activity varies less with concentration and appears to be inhibited by nitrogenous compounds to a lesser extent than is the case with chlorine.—E. B.

RUSHCHITS, A. S. (1943.) Zo'l'no-shchelochnye rastvory v kachestve dezinfitsiruyushchikh sredstv pri yashchure. [Alkaline ash solutions as disinfectants for foot and mouth disease].—*Veterinariya, Moscow*. No. 10-11. pp. 41-42. 349

The growing need of collective farms for caustic soda and formalin as disinfectants for F. & M. disease and the inability of the chemical industry to produce adequate supplies, led to the investigation of the disinfectant properties of the ash of commonly used fuels, such as "saksaul", birch, peat, cow-dung cake, spruce, weeds, straw and sunflower. Fuels were burnt in pans and the pH of ash solutions estimated electrometrically. Solutions were prepared in concentrations approximating the pH of 1% caustic soda solution.

The highest degrees of alkalinity were obtained from 15% solution of straw ash (pH 10.0), 10% solution of spruce ash (pH 11.1), 20% solution of birch ash (pH 12.1) and 20% solution of "saksaul" ash (pH 12.3).

Used experimentally, the solutions of "saksaul", birch and straw ash in 20% concentration and of spruce ash in 10% concentration destroyed the F. & M. disease virus, *in vitro*, after 2 hours' exposure. The best disinfectant was obtained from spruce ash.—E. CHERKESI

See also absts. 208 (mastitis treatment), 322 (wound treatment), 246 (phenanthridinium), 269 (treatment of anaplasmosis), 280 (anthelmintics for horses).

## HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

KUKHARKOVA, L. (1943.) Veterinarno-sanitarnyy nadzor na myasopererabatyvayushchikh predpriyatiyakh. [Veterinary inspection of meat-manufacturing industries].—*Veterinariya, Moscow*. No. 7. pp. 32-34. 350

K. gives a brief historical survey of abattoirs before 1914. A thorough reorganization of meat manufacturing industries was carried out in 1937 to co-ordinate veterinary laboratory control and production. The number of chemico-bacteriological laboratories rose from 6 in 1930 to 103 in 1939, the number of bacteriologists from 6 to 85, and the number of chemists from 20 to 283.

A specialized training for this work was undertaken by the veterinary high school where a separate faculty

was created for this purpose; this ceased to exist at the beginning of the war.

The bulk of the article is devoted to details of control of meat manufacturing industries from the inspection of stock at the supply base through all stages to the production of food at the factories.—E. CHERKESI.

— (1943.) Deutsches Reich. Runderlass des Reichsministers des Innern, betr. Richtlinien für die Abwasserbeseitigung bei Tierkörperbeseitigungsanstalten. [Germany: circular concerning the directions for disposal of waste water from animal carcass disposal plants].—*Reichsgesundheitsblatt*. 18. 733-736. 351

This is a description of the various classes of waste



water which require disposal at carcass disposal plants and includes condensed vapour from the boiling vessels, cooling water, rain water and all waters used personally by the workers.

Physical and chemical characteristics of these waters are described and instructions for filtering, gully traps, etc., are given.

There is nothing about disinfection for the prevention of spread of infections.—J. E.

SNAPPER, I. (1944.) Salmonellosis caused by the ingestion of ducks' eggs.—*Amer. J. digest. Dis.* 11. 8-10. 352

S. gives a short survey of the public health aspect of salmonellosis in ducks. The frequent occurrence, especially in Western Europe and in the Far East, of this type of food poisoning is emphasized. The possibility that ducks' eggs may be partly responsible for the frequent outbreaks of human salmonellosis in the Orient is discussed.—ANTHONY BUXTON.

— (1945.) Bill No. 24 of 1945. An act respecting veterinary services in rural areas in Saskatchewan.—*Canad. J. comp. Med.* 9. 108-110. 353

Under the Veterinary Services Act, 1945, any council or rural municipality may enter into an agreement with one, two or three contiguous rural municipalities for the establishment of a Veterinary Service District. There shall be a Veterinary Service Board for each district, consisting of one representative appointed by the council of each co-operating municipality, a corresponding number of members appointed by the Lieutenant-Governor in Council and the agricultural representative for each co-operating municipality. The objects of the board shall be to render financial or other assistance to enable and encourage veterinarians to practise in the district at fees uniform throughout the district, to enable veterinarians to confer together, to prevent the spread of diseases among farm animals

and to perform such other duties as may from time to time be assigned to boards by the Minister of Agriculture or the Lieutenant-Governor in Council. Each district shall be financed by payments from the council of each co-operating municipality, together with a legislative grant, which shall be of an amount equal to the total of the sums appropriated by the municipalities, but shall not exceed \$1,000 for any district in any fiscal year.

The district board may pay to the veterinarian an annual fee not exceeding \$2,000 as may be agreed upon. A scale of veterinary fees is included. All medicines and material used are extra.—THOS. MOORE.

— (1943.) Zooveterinarnaya set' Moskovskoi oblasti v dni Otechestvennoi voyny. [Veterinary services in Moscow province in wartime.]—*Veterinariya, Moscow*. No. 10-11. pp. 11-12. 354

In this report of the successful work of the Veterinary Service in the three districts of the Moscow province, success is largely attributed to the systematic dissemination of veterinary knowledge among veterinary assistants and farm workers by means of frequent discussions, lectures, broadcasts and short courses.—E. CHERKESI.

— (1943.) Vetrabotniki v bor'be za dal'nishii pod'em zhivotnovodstva i konevodstva. [Veterinary workers in contest for further increases in husbandry and horse breeding.]—*Veterinariya, Moscow*. No. 5-6. pp. 16-19. 355

The article lays great stress on the strict observance of veterinary regulations as a first and indispensable condition for the maintenance and increase of livestock on collective farms. It recommends greater individual care of horses, frequent examination for injuries, the inspection of harness and fodder, etc., the prohibition of slaughter for food of animals under one year, the collection of medicinal plants and the local manufacture of bone meal and other feeding stuffs.—E. CHERKESI.

## TECHNIQUE AND APPARATUS

KNOX, R. (1945.) Effect of penicillin on cultures in liquid and solid media.—*Lancet*. 248. 559-561. 356

Young cells of *Streptococcus pyogenes* or staphylococci may be lysed in a concentration of penicillin which has no effect on old cultures.

Young cultures of pneumococci and meningococci are also lysed but haemolytic streptococci are generally not lysed. The results suggest that penicillin treatment is probably most effective in infections, during the phase of rapid bacterial growth.—E. BOYLAND.

OLSON, C., Jr., & WARREN, F. G. (1944.) Mechanical aids in the direct microscopic method of counting bacteria.—*J. Bact.* 47. 495-497. 357

A vertical spindle carrying an adjustable arm on which a diamond point is mounted enables a circle of required diameter to be described on a microscope slide.

Notches on the two knobs of the mechanical stage of a microscope are made so that a stop spring may interrupt movement. By this means, equally spaced fields along both directions of movement of the stage are obtained. This eliminates the random selection of fields in any known area of film.

Both these mechanical aids follow the observations of HANKS & JAMES (1940) on the increased accuracy attained by counting a series of equally spaced fields across the diameter of a certain film.—J. E. LANCASTER.

See also abstr. 284 (Weltmann reaction).

## MISCELLANEOUS

— (1943.) O II Congresso Brasileiro de Veterinária. [Report on second Brazilian veterinary congress, held at Belo Horizonte, autumn 1943.]—*Bol. Soc. brasil. Med. vet.* 12. 179-230. 358

Among the recommendations approved by the Congress for consideration by the authorities were the following:—there should be a standard method throughout the country for the preparation of anti-rabies vaccine; swine fever vaccines should be thoroughly tested before being given official approval; milk should be sold on the basis of fat content; meat inspection and veterinary education should be improved and knowledge about animal health disseminated among the ranchers; there should be a survey of the incidence of equine

encephalomyelitis and the strains of virus found should be typed, so that the production of chick embryo vaccine may begin immediately, and the use of aluminium hydroxide foot and mouth disease vaccine should be investigated.

The report gives short summaries of papers presented to the Congress. These deal with many subjects, including the inspection of meat, milk and milk products, the control of biological reagents, the control of sheep and cattle dips, suggestions for a plan to control diseases of sheep and goats, vaccination against F. & M. disease, various aspects of brucellosis, artificial insemination, mineral deficiency diseases and poultry husbandry.

ALICE reported the isolation of the virus of lymphocytic choriomeningitis from a g. pig.

RUSO reported a case of gas gangrene in a horse, caused by *Clostridium welchii* (type not stated).

CORRÊA showed that 9.44% of 27,887 bovines tested with tuberculin in Rio Grande do Sul during 1937-42 gave positive reactions. Decrees were passed in 1941 allowing only non-reacting foreign breeding stock to enter the country. Similarly, animals entered for shows must have passed the tuberculin test. 12.04% of 4,905 animals reacted to the agglutination test for *Brucella abortus* infection and the same laws were brought into force for brucellosis as exist for TB. The use of strain 19 vaccine is now under consideration.

After carrying out cross-immunity tests, CUNHA believed that what is known as the Bahia strain of EQUINE ENCEPHALOMYELITIS virus is really a rabies virus.

LAMOUNIER and HIPÓLITO reported 100% efficiency for the tuberculin test in detecting positive cases of avian TB, stating that one test does not desensitize the birds for a further test 14 days later.

GIÓVINE *et al.* presented a summary of the lesions of necrobacillosis found in domestic animals in Minas Geraes. The treatment of cases consists essentially in ensuring aerobic conditions by means of scrupulous cleanliness, and irrigations with potassium permanganate and 10% copper sulphate solution. Sulphonamides (type not stated) are recommended for the treatment of internal necrobacillosis.

D'APICE reported immunity of at least 12 months' duration, following vaccination against swine fever with crystal violet vaccine.

A case of unilateral brucellar orchitis in a two-year-old zebu was reported by HIPÓLITO & GIÓVINE.

NRIVA reported the preservation of vaccine lymph by means of the sulphonamides.

DE SOUSA stated that vaccination against fowl cholera by the oral route is effective, both when given directly into the mouth and when given in the food.

Tumours reported include a soft odontoma of the lower jaw of a zebu cow, embryonic nephroma of a goat kidney, equine testicular embryoma and spindle-cell sarcoma in the kidney of a domestic fowl.

MEGALE described an apparatus to be used in operating on phimosis and acrobystitis in breeding bulls. It is in two parts, one of which is designed to arrest haemorrhage and fix the mucosa, the other being for the prevention of cicatricial contraction.

A bat, *Desmodus rotundus*, is mentioned by DE OLIVEIRA as a possible transmitter of *Trypanosoma equinum*.

FREITAS & HIPÓLITO presented an article on helminthiasis of the domestic fowl in Minas Geraes, citing 26 species of helminths, of which the commonest were *Capillaria collaris*, *C. annulata*, *Davainea proglottina*, *Tetrameres confusa*, *Ascaridia galli*, *Strongyloides oswaldi*, *Heterakis gallinae* and *Acuaria hamulosa*.

DE MORAIS *et al.* reported finding *Fatobatrachophyton album* in cases of bovine ringworm.

DE MELO MALHEIRO *et al.* confirmed the fact that *Demodex canis* (ovum, nymph or adult) may be found in the lymph nodes of dogs affected with demodectic mange and gave a short account of the skin and lymph node lesions found in six cases.

ORLANDINI stated that 62.5% of lungs examined in the Sao Paulo cold store were infested with *Metastrongylus salmi*.—I. W. BROCKLEHURST.

## REPORTS

GREAT BRITAIN. (1943.) [Report of] the West of Scotland Agricultural College [1942].—*Trans. Highl. agric. Soc. Scot.* 55. 102-104. 359

Treatment by cobalt of land on which occurs the sheep disease known as "VINQUISH" appears to have reduced the incidence of the disease. Phylloerythrin in high concentrations has been demonstrated in the blood and tissues of lambs affected with "HEAD GRIT". The artificial insemination of mares in which conception failed to follow natural service gave inconclusive results. The advantage of the depression of freezing point as a method of distinguishing between milk of poor quality and watered milk is stressed. Adequate cleansing of milk utensils was shown to be necessary prior to disinfection.—G. B. S. HEATH.

UNION OF SOUTH AFRICA. (1944.) The agricultural industry after four years of war. Report of the Department of Agriculture and Forestry and of the Food Control Organization for the year ended 31 August, 1943. [VILJOEN, P. R.]—*Fmg S. Afr.* 19. 131-201. Items of veterinary interest pp. 196-198. 360

EAST COAST FEVER was the most troublesome disease the department was required to deal with. In the North Natal Vryheid district, the disease spread so rapidly that dipping and quarantine measures were insufficient to control it, and a voluntary system of slaughter of cattle on infected farms was introduced. Drought in Zululand caused the limits of the tsetse fly to be considerably extended by game and hence NAGANA increased in certain areas. The policy of game-shooting was adopted in order to force it back to the Northern areas. The position with regard to SHEEP SCAB was satisfactory, only 19 outbreaks being recorded during the year. Large numbers of cattle were inoculated against ANTHRAX but owing to the shortage of

syringes and needles the programme had to be curtailed. The position with regard to TUBERCULOSIS was unsatisfactory, as only 84 herds were participating in the Department's test scheme and too few farmers were building up officially recognized clean herds. TICK-BORNE DISEASES amongst cattle and INTERNAL PARASITES amongst small stock caused high mortality. A poisonous alga in the Vaal dam caused great losses when ingested by stock. The latter section of the report deals with insect pests, plant diseases and locust destruction and is not of direct interest to veterinarians.—T. E. GIBSON.

Fiji. (1944.) Annual report for the year 1943. [Department of Agriculture.]—*Agric. J. Fiji.* 15. 62-72. [Items of veterinary interest pp. 67-68.] 361

REPORT OF VETERINARY DIVISION [TURBET, C. R.]—In work on TUBERCULOSIS control 4,506 cattle were tuberculin-tested and 5.6% reacted. In addition, 237 cattle were slaughtered on clinical diagnosis of the disease. The incidence of BOVINE CONTAGIOUS ABORTION was about 4.8% of 146 animals tested. A few calves were inoculated with live vaccine and the evidence of several years is said to indicate that the treatment is successful. FILARIASIS of dogs continues to be prevalent. Foudin gives "some success". Intestinal parasites increase debility and malnutrition in the dry season when food is scarce.

INFECTIOUS KERATITIS occurred among horses in the Western District and is said to have caused mortality among calves. 1,145 animals were examined clinically and bacteriological examinations were made as required. Livestock inspections were carried out on 45,000 cattle, 7,000 horses, 12,000 goats and 2,500 pigs. No recent census of livestock has been taken. According to the 1941 census figures—there are 84,000 cattle, 16,000 horses, 8,500 pigs, 27,000 goats, 365 sheep and about



118,000 poultry. Details are given of the methods adopted to improve the local breeds of animals and to increase the output of animal products. Goat meat was selling in one district for 3s. 6d. a lb. Very few animals were imported—but one dog illegally imported by air was the cause of a serious outbreak of distemper. The Veterinary and Fisheries services are combined. —J. A. GRIFFITHS.

U.S.A. (1944.) Fifth annual report of the Regional Poultry Research Laboratory, East Lansing, Michigan, July 1, 1943 to June 30, 1944. [WINTON, B.] pp. 27. 4to. Mimeographed. 362

As in previous years, research at this laboratory was limited almost exclusively to the problem of LYMPHOMATOSIS. Progress was made with the development of disease-resistant lines by breeding year after year from males and females whose brothers, sisters and progeny showed the lowest incidence of lymphomatosis when all birds were equally exposed to infection. Variation in mortality was most marked in some lines. One susceptible line showed over a period of three years an average mortality to 300 days of age of 47.2%, whereas with a resistant line, the average mortality for the same period was 11.1%.

The development of "free" stock was continued under conditions of the strictest possible isolation. Chickens from the "free" stock were also raised in other buildings with a mixed population and by the time they were 300 days old, mortality from lymphomatosis was 30%, in contrast to no loss at all from this disease amongst their sibs in the isolation house. For the proper study of the disease it is vital that stock "free" from lymphomatosis be maintained to provide a conception of normality on which to base a diagnosis.

Experimental evidence was also obtained to show that transmission of lymphomatosis may occur when chickens from "free" stock are brooded and raised in pen contact with infected birds, although others from the same stock reared in isolation were free from the disease at 300 days old. The hatching egg was also incriminated as a possible means of transmitting the disease. In one experiment, 9% of the chickens hatched from the eggs of infected parents died from lymphomatosis before they were 300 days old, although they were reared in strict isolation.

The study of a transmissible tumour derived from a bird showing visceral lymphomatosis was continued with particular reference to its transmission, propagation, immunological properties and the viability of the infective agent. This strain, R.P.L.12, is said to have many similarities to lymphomatosis and is thought to be of value for comparative studies related to the pathogenesis of the condition. Clinical symptoms did not prove satisfactory for the study of the onset and development of the disease from its earliest stages.

Mortality statistics had indicated that females were more likely to develop lymphomatosis than males and an attempt was made to determine the influence of the gonads on the incidence of the disease. Castration of

both males and females caused an increase, although more pronounced in the males than in the females, but the incidence amongst both castrated and normal males was reduced by the use of sex hormones (diethyl stilboestrol and testosterone dipropionate).

Details are also given of work carried out in collaboration with State Agricultural Experiment Stations.—J. D. BLAXLAND.

ALGERIA. (1942.) Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1941. [Report of the work of the Pasteur Institute, Algeria, for 1941.] [SERGENT, ED.]—Arch. Inst. Pasteur Algér. 20. 249-291. 363

In the administration of BCG vaccine, Rosenthal's simple cutaneous method is considered from recent observations on the premonition of TUBERCULOSIS to be more reliable than the oral route in dealing with large numbers of children.

Further proof of the role of *Phlebotomus* species in the transmission of LEISHMANIASIS was obtained in the Western Mediterranean. *P. perniciosus* and, in the Eastern Mediterranean, *P. major* and its variant *P. syriacus* are the most important transmitters of leishmaniasis. Another transmitter, particularly in North Africa, is *P. longicuspis*. In Southern Algeria *P. papatasi* has already been proved the transmitting agent.

Reference is made to the use in the place of hyperimmune serum for the control of SWINE FEVER of phenolized blood plasma obtained from hyperimmunized pigs.

*Oestrus ovis* infestation of the eyes of two human beings was recorded by Manne and Pédoya in the Sud territories.

The blood was studied of 65 camels in the area between 8° E. and 3° W. longitude and 22° and 35° N. latitude. The red cells were elliptical in form, 6.0-8.5  $\mu$  in length and 3.5-5.2  $\mu$  in width. Normoblasts were very rare. The percentage of leucocytes was as follows: polynuclear neutrophiles, 54.5%, eosinophiles, 3.7%, basophiles, none; lymphocytes small, 2.6% and large, 27.6%; monocytes, 11.6%.—J. A. GRIFFITHS.

U.S.S.R. (1943.) Nekotorye raboty Tsentral'noi nauchno-prakticheskoi dezinfektsionnoi laboratorii NKZ SSSR. [Research work of the Central Laboratory for Disinfection, Ministry of Agriculture.] [KORNEEV, I. P.]—Veterinariya, Moscow. No. 5-6, pp. 32-33. 364

The veterinary staff of the Central Laboratory was reduced during the last quarter of 1941 and 1942 from ten to four.

Research was carried out on the disinfection of goods wagons, hides and drains, the transport of stock and meat by rail and the examination and purification of water in watering places under field conditions.

Hides and skins were tested for ANTHRAX and advice was given to departments dealing with the treatment of skins and fur.—E. CHERKES.

See also absts. 254 (Pasteur Institute, Paris, 1941), 358 (Brazilian veterinary congress, 1943).

## BOOK REVIEW

DE LA CRUZ, F. M. (1943.) Brucellosis en Cuba. [Brucellosis in Cuba.] pp. 288. Camaguey, Cuba: El Camagueyano, Cia. Comercial, S.A. 8vo. 365

All the articles which have been written on human brucellosis in Cuba since the end of the last century have been collected together and published in this volume. There have been very few confirmed cases of brucellosis on the island and none has been fatal, so

that the more obscure manifestations of the disease have not been described. *Brucella suis*, *Br. abortus* and *Br. melitensis* have all been involved in the production of human disease in Cuba.

This book is mainly of local historical interest and contains no new information. The author proposes to compile a similar collection of the Cuban literature on animal brucellosis.—I. W. BROCKLEHURST.

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